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BRITISH MUSEUM (NATURAL HISTORY)

INSECTS OF SAMOA
AND OTHER SAMOAN TERRESTRIAL
ARTHROPODA

PART VI. DIPTERA

FASC. 8. Pp. 267-328.

DROSOPHILIDAE, EPHYDRIDAE, SPHAEROCERIDAE
and MILICHIIDAE.

By J. R. MALLOCH,

(U.S. Bureau of Biological Survey, Washington, D.C., U.S.A.).

WITH SIXTEEN TEXT-FIGURES.



LONDON

PRINTED BY ORDER OF THE TRUSTEES OF THE BRITISH MUSEUM

SOLD AT

THE BRITISH MUSEUM (NATURAL HISTORY), CROMWELL ROAD, S.W.7

AND BY

B. QUARITCH, LTD.; DULAU & CO., LTD.; AND THE OXFORD UNIVERSITY PRESS.

1934

Issued 23rd June, 1934.

[Price Two Shillings and Sixpence.]

INSECTS OF SAMOA

AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

Although a monograph, or series of papers, dealing comprehensively with the land arthropod fauna of any group of islands in the South Pacific may be expected to yield valuable results, in connection with distribution, modification due to isolation, and other problems, no such work is at present in existence. In order in some measure to remedy this deficiency, and in view of benefits directly accruing to the National Collections, the Trustees of the British Museum have undertaken the publication of an account of the Insects and other Terrestrial Arthropoda collected in the Samoan Islands, in 1924-1925, by Messrs. P. A. Buxton and G. H. E. Hopkins, during the Expedition of the London School of Hygiene and Tropical Medicine to the South Pacific. Advantage has been taken of the opportunity thus afforded, to make the studies as complete as possible by including in them all Samoan material of the groups concerned in both the British Museum (Natural History) and (by courtesy of the authorities of that institution) the Bishop Museum, Honolulu.

It is not intended that contributors to the text shall be confined to the Museum Staff or to any one nation, but, so far as possible, the assistance of the leading authorities on all groups to be dealt with has been obtained.

The work is divided into nine "Parts" (see p. 3 of wrapper), of which each is subdivided into "Fascicles." Each of the latter, which appear as ready in any order, consists of one or more contributions. On the completion of the systematic portion of the work it is intended to issue a general survey (Part IX), summarising the whole and drawing from it such conclusions as may be warranted.

A list of Fascicles already issued will be found on pp. 3 and 4 of this wrapper.

N. D. RILEY,
Keeper of Entomology.

BRITISH MUSEUM (NATURAL HISTORY).
CROMWELL ROAD, S.W.7.

INSECTS OF SAMOA

PART VI. FASC. 8

DIPTERA

DROSOPHILIDAE

By JOHN R. MALLOCH, U.S. Bureau of Biological Survey, Washington, D.C.,
U.S.A.

(With 16 Text-figures.)

THIS family is remarkably well represented in Samoa, there being ten genera and twenty-seven species in the collection before me, which probably do not complete the number occurring in the islands, as many of the species are very small and are unlikely to be taken except when especially hunted for in certain habitats.

I have recently written a report on the family as it occurs in the Marquesas Islands, and find that there are some distinctions in the representatives of the two groups of islands that are difficult to explain. In Samoa we have apparently a great diversity of species, in the main offshoots from *Drosophila*, though placed in groups which we designate "genera," while in the Marquesas the greatest diversity occurs in the forms that have apparently been derived from *Scaptomyza*.

Dr. O. Duda has in recent years done a large amount of work on this family, but his papers are difficult to comprehend, because of the changing of names and the rather haphazard associations of the species of various genera and subgenera in his synoptic keys. However, I have tried to clear up some points in connection with the genera dealt with herein, and hope that it may be possible for subsequent workers to identify the species with certainty from the data used in the present paper.

I give below a key to the Samoan genera, as some are new to science, and in other cases I have employed characters not generally used by other workers in generic descriptions.

The great majority of the species of the family occur in their larval stages in decaying fruits and vegetables, fermenting matter, or fungi, though in a few instances species have been discovered (in other parts of the world) that have more specialized habits ; in one genus the larvae occur in the frothy covering of nymphal Hemiptera ; in another they associate with mealy bugs, though in neither case is it definitely established what the relations are.

Bezzi, in his book on the Diptera of Fiji, recorded only eight species of this family from these islands, which he placed in three genera.* He did not recognize *Spinulophila*, though one of his species is referable to it, and thus he had four genera. Of these four, *Leucophenga* Mik is unrepresented in this collection, but it is very probable that it will yet be found to occur in Samoa.

KEY TO GENERA.

1. Mesonotum with at most four series of fine intradorsocentral hairs and always with at least two pairs of well developed postsutural dorsocentral bristles 2
- Mesonotum with at least six series of fine intradorsocentral hairs 4
2. Mesonotum with three pairs of dorsocentral bristles, the anterior pair sometimes presutural ; scutellum flattened above, more or less elongated and somewhat pointed at apex, occasionally haired on sides ; robust species, with prominent stout facial carina *Samoaia*, gen. n.
- Mesonotum with but two pairs of dorsocentrals, both postsutural ; scutellum more or less convex above or not pointed apically, and bare on sides ; slender species, with inconspicuous facial carina 3
3. Frons with a large glossy central triangle that extends to anterior margin, and is narrowly separated from the shining orbits by a dull line on each side ; fore femur with a series of minute stout black spines on the apical half of the anteroventral surface *Liodrosophila* Duda.
- Frons without a large glossy central triangle as described above, a greater proportion of the surface dull coloured ; fore femur without anteroventral series of short stout spines *Scaptomyza* Hardy.
4. Proboscis heavily chitinized, straight, and downwardly projected, the apical section fully as long as the height of the head *Zygothrica* Wiedemann.
- Proboscis stout, not nearly as long as height of the head 5
5. Frons either entirely glossy or with only a fine line of dull surface separating the large triangle from the orbit on each side 6

* I add the record of another species from Fiji in the present paper.

- Frons either entirely dull or with the triangle small and separated from the orbits by a dull triangle on each side that extends to or almost to the vertex. 7
- 6. Entire frons highly polished; fore femur without an antero-ventral comb of very small spines or bristles *Lissocephala* Malloch.
- Frons with a depressed dull line on each side or triangle separating it from the orbits; fore femur with an antero-ventral comb of minute stout bristles or spines on apical half or more *Liodrosophila* Duda.
- 7. Hind tibia with a short but distinct bristle about one-third from the base on the posterodorsal surface; all three orbital bristles long, the anterior reclinate one slightly proximad and laterad of the proclinate one *Upolumyia*, gen. n.
- Hind tibia without a posterodorsal bristle near base; orbital bristles not of equal strength, the anterior reclinate one usually minute or differently situated 8
- 8. Mesonotum deep black, very distinctly convex, with but one pair of dorsocentrals and no well differentiated acrostichals, the fine hairs usually ceasing at level of the bases of the dorsocentrals which is well in front of the hind margin; wing with a deep notch before apex of first vein, the apex of the costal division proximad of the notch deep black *Mycodrosophila* Oldenberg.
- Mesonotum variously coloured, rarely deep black, not as markedly convex, and with at least two pairs of well-developed dorsocentrals 9
- 9. Third antennal segment larger than usual, with dense pile amongst which on the upper edge there are a number of very fine outstanding hairs that are almost as long as the width of the segment; face sharply carinate above; arista with only one hair below *Hirtodrosophila* Duda.
- Third antennal segment merely pilose, rarely with a few much shorter hairs; other characters not as above *in toto* 10
- 10. Face much narrowed below, at vibrissae only about half as wide as at antennae; scutellum with the basal pair of bristles much shorter than the apical pair; fore femur without an anteroventral comb *Hopkinsomyia*, gen. n.
- Face almost parallel-sided; scutellum with the basal and apical pairs of bristles usually subequal in length 11
- 11. Fore femur without an anteroventral series of short stout spines apically *Drosophila* Fallen.
- Fore femur with an anteroventral series of short stout spines on apical half *Spinulophila* Duda.

It must be noted here that I have included in the key the genus *Liodrosophila*, which does not have any representatives in the Samoan collection before me. I have done so for two reasons. In the first place it is very probable that some species of the genus do occur in Samoa, and in the second place there has been no

revision of the genera in which it has been compared with *Lissocephala*, and this opportunity is taken to make the necessary comparison. I have before me two species that will fall in Duda's genus according to his definition, but they are quite different in many details, and this suggests to me that there may be a further division necessary to accommodate some of the Malayan species from which region my material came. I do not discuss *Liodrosophila* in the following text.

Samoaia, gen. n.

This genus is quite similar to *Drosophila* Fallén, the wing venation being of the same general type, but the thorax has three pairs of dorsocentral bristles, the anterior pair being close to the suture, or even before it, and there are presuturally at most four series of intradorsocentral hairs. The scutellum is flattened above and more or less pointed at apex, with or without a few short hairs on each side of basal half. The prealar bristle is well developed, and the fore and mid tibiae have the preapical dorsal bristle microscopic, while the hind tibiae lack that bristle. All the known species are much stouter than those of *Scaptomyza* Hardy.

I have recently described a genus from the Marquesas Islands that agrees with this one in having the prealar bristle well developed and the scutellum much the same in form, but in that genus, *Marquesia* Malloch, there are four pairs of dorso-centrals, three of which are behind the suture, all the tibiae have the preapical dorsal bristle well developed, at least as long as the tibial diameter, and the tarsi different in the shape of the basal segment.

Genotype, *Samoaia ocellaris*, sp. n.

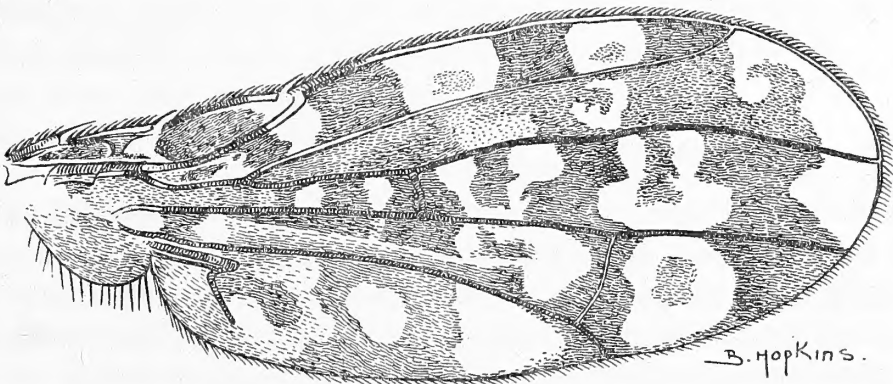
KEY TO THE SPECIES.

- | | |
|---|---------------------------|
| 1. Wings with very distinct brown or fuscous markings on a hyaline ground; legs yellow, with very distinct brown annuli on femora and tibiae | 2 |
| — Wings brown, distinctly shining, not pictured; legs yellow, the femora and tibiae not annulate, with brown in one species | 3 |
| 2. Fore coxae and all the femora dark brown, the latter each with a pale yellow preapical annulus; second posterior cell of the wing with a large round hyaline spot with a dark brown dot in its centre, without an ocellate spot at apex of submarginal cell, and but two ocellate spots on marginal cell beyond apex of first vein; frons with deep blackish brown marks on sides and centre; sides of the scutellum with no stiff hairs basally | |
| | <i>ocellaris</i> , sp. n. |

- Fore coxae and all femora whitish yellow, the former with a dark brown basal spot, each femur with a dark mark at extreme apex, and one beyond middle on posterior surface that is sometimes duplicated on the anterior side, the fore pair with an additional spot at base in front; all tibiae with two dark annuli; fore tarsus with the basal three segments dark brown; second posterior cell of the wing without an ocellate hyaline spot, irregularly marked with dark brown, with an ocellate spot at apex of submarginal cell, and three ocellate spots in marginal cell beyond apex of the first vein; frons without definite dark marks; sides of the scutellum with some stiff short hairs basally *comma*, sp. n.
3. Legs yellow, marked with brown almost exactly as in *comma*, and the vibrissal angle with the usual dark spot; mesonotum with four brown vittae, the central two extending over the disc of the scutellum; sides of scutellum bare. *nuda*, sp. n.
- Legs entirely honey-yellow, and the vibrissal angle without a brown spot; mesonotum shining honey-yellow, without any darker vittae; sides of the scutellum with a few stiff hairs basally *hirta*, sp. n.

1. *Samoaia ocellaris*, sp. n. (Text-figs. 1 and 2).

A very pretty species, of a general testaceous yellow colour, with dark brown markings of frons and face, irregular brown markings on the mesonotum and



TEXT-FIG. 1.—*Samoaia ocellaris*, wing.

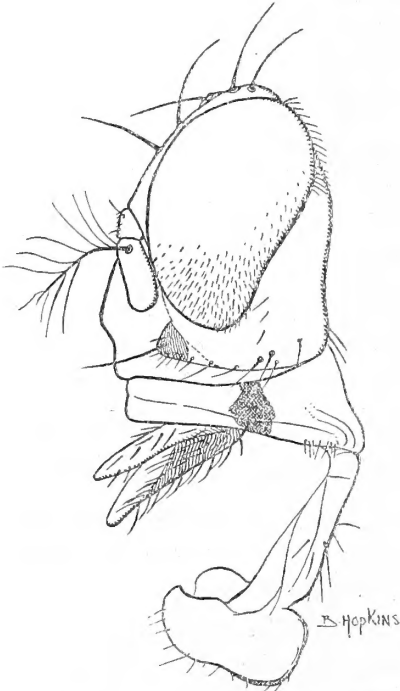
scutellum, the abdomen mainly blackish-brown, legs testaceous with dark brown bands, and the wings marked as Fig. 1.

Length, 2.5–3.5 mm.

Head shining testaceous yellow, with the following blackish-brown markings: a transverse stripe on vertex, both orbits except at bases of the bristles

and in front, and a central stripe that tapers in front and does not extend to anterior margin, a spot behind middle of each eye, a larger one on posterior part of genae, one on the vibrissal angle, and one across upper half of face; basal two segments of antennae shining testaceous yellow, third except at extreme base dark brown; aristae brown, paler at bases, the rays dark; palpi testaceous yellow, blackened on basal third. Frons at anterior margin fully as wide as

long in centre, widened to posterior margin, the vertical, ocellar, and upper reclinate orbitals longer than the postvertical and proclinate orbital bristles, the lower reclinate bristle microscopic or lacking. Face with a very pronounced central carina which is rounded, nose-like, and highest at middle of face, rather abruptly rounded off below (Fig. 2), the sides of face parallel; prelabrum well-developed but not produced beyond epistome in profile; eyes narrowed below, with stiff yellow hairs; one well-developed vibrissa; second segment of antenna rather tumid, with two bristles above set at different inclinations, the one nearest apex the shorter; arista with almost invariably ten free hairs, six above, one at apex, and three below; palpi moderately wide, each with one moderately long apical setula and a number of shorter hairs below.



TEXT-FIG. 2.—*Samoaia ocellaris*, head in profile. (Markings on frons and back of head omitted.)

Thorax testaceous, densely yellowish-grey dusted, the mesonotum with a dark brown pattern consisting of the usual four vittae modified by the presence of oblique connecting lines of the same colour between the bristles, the latter being isolated upon spots of the yellowish-grey dust; scutellum dark brown, with dusted spots on each side at base, on centre of disc, and at apex; pleura blackish-brown. All three pairs of dorsocentrals long and strong; upper humeral and posterior notopleural short and fine; sternopleura with two bristles, the lower posterior one the longer and stronger. Intradorsocentral hairs biserial on almost the entire extent of the mesonotum. Scutellum without any lateral marginal hairs.

Abdomen blackish-brown, slightly shining, with greyish dust on dorsum,

but no distinct markings evident, though the dust is denser across centre of each tergite ; the apical segments yellowish.

Legs honey-yellow, shining, all coxae, all femora except a narrow preapical annulus, and three annuli on each tibia, dark brown ; fore tarsi not darkened. Fore femur with a series of fine posteroventral and a posterodorsal series of bristles, one beyond middle of each series much longer than the others, most noticeably so below, the anteroventral surface without noticeable hairing. Tibiae without exceptional hairing, the preapical setulae on fore and mid pairs very short, none on the hind pair. Tarsi slender, the fore pair slightly more so than the others, all at least as long as their tibiae, the basal segment as long as the other segments combined, the mid one with a series of closely set microscopic hairs on the posteroventral edge and a closer series of shorter hairs on the anteroventral one, the other parts of the segment almost nude ; apical ventral spur of mid tibia about one-third as long as the basal segment of its tarsus.

Wings yellowish hyaline, with dark brown markings as Fig. 1. Inner cross vein close to middle of the discal cell ; apex of second vein rather broadly curved forward to connect with the costa.

Halteres dull yellow. Squamal hairs dark and quite long.

Holotype, ♀, Upolu : Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

Paratypes, Upolu : Apia, 29.iii.1924, Malololelei, 2,000 feet, 20.vi.1924, Buxton & Hopkins. Savaii : Salailua, 16, 21, and 23.v.1924, Bryan.

2. *Samoaia comma*, sp. n. (Text-fig. 3).

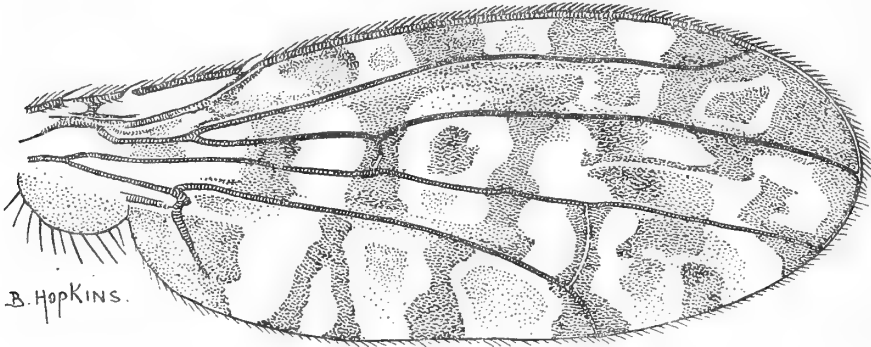
This species has the wings rather similar in markings to those of *ocellaris*, but an examination of Fig. 3 will show many distinctions in the details. There are many other characters for the distinction of the two species, the most readily visible being found in the less distinctly marked frons and mesonotum, in the more spot-like dark markings of the femora, and in the darkened bases of the fore tarsi.

Length, 3–4 mm.

Head clay-yellow, with a deep black mark on each vibrissal angle and one on each side of the facial carina at middle of face, the frons faintly darker on each orbit above middle and across front, and the occiput with a greyish central mark above neck ; antennae brownish or fuscous, paler on underside of second

segment, the aristae and rays brown; palpi whitish-yellow, blackened on lower edge from base to near apex. General structure much as in *ocellaris*, but the vertex has a marked emargination on each side between ocelli and vertical bristles, and the facial carina extends farther towards the epistome and is not as abruptly precipitous below, while the palpi are larger, and rather definitely lanceolate, tapered to apex, more numerous hairy both on upper and lower edges and without a strong apical setula. Arista with thirteen free hairs (9 : 1 : 3).

Thorax testaceous yellow, the pleura much paler than the mesonotum, the latter and the scutellum shining brown, the mesonotum with four broad, dark brown vittae that are not conspicuous, the outer pair not extending to anterior margin and interrupted at suture, all four falling short of attaining the posterior



TEXT-FIG. 3.—*Samoaia comma*, wing.

margin, the scutellum with faint dark brown markings, the most evident across base. Pleura with the following brownish-black spots: a large one on upper and a smaller one on lower margin of mesopleura, one on pteropleura, one on upper margin of the sternopleura, and one on the metathoracic spiracle. Postnotum dark brown in centre. All three pairs of dorsocentral bristles strong; intradorsocentral hairs biseriate except on posterior fourth or less of their extent where they are quadriseriate. Scutellum with a few setulose hairs on sides basally. Sternopleura as in *ocellaris*.

Abdomen dark brown, the anterior margins of the tergites testaceous yellow, but the pale parts visible usually only below.

Legs pale stramineous, with the following dark brown to black marks: a spot at base of fore coxae and one on anterior side of each mid coxa, the entire trochanters, extreme apices of all femora, a spot just beyond middle on posterior

side of each femur which is usually duplicated in front on at least the fore and hind pairs, and a spot at base of fore pair on anterior side, three annuli on each tibia, the one at base partial, and the basal three segments of fore tarsi. Armature of legs as in the preceding species, the hind metatarsus with two short black setulae at base below and a ridge with microscopic contiguous black spinules on the entire length of the anteroventral edge.

Wings as in *ocellaris*, but the markings different (Fig. 3), especially round the margin.

Holotype ♂, Upolu : Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

Allotype and five paratypes, Savaii : Salailua, May, 1924, Bryan.

Paratype, Upolu : Vaea, 1,100 feet, 25.iv.1924, Bryan.

3. *Samoaia hirta*, sp. n. (Text-fig. 4).

This and the next species are quite different from the two preceding species in having the wings almost uniformly yellowish-brown, without definite hyaline marks, though there is in some cases a rather evident paler streak along each side of the fifth vein on almost the entire extent of the discal cell, and in addition to this the first posterior cell at least has the surface slightly bulged up at several points, without bullae, and showing light or dark according to the angle from which the surface is viewed. In *hirta* there is no dark spot on the vibrissal angle, nor are there any traceable vittae on the mesonotum, and the sides of the scutellum are partly haired basally.

Length, 3.5–5 mm.

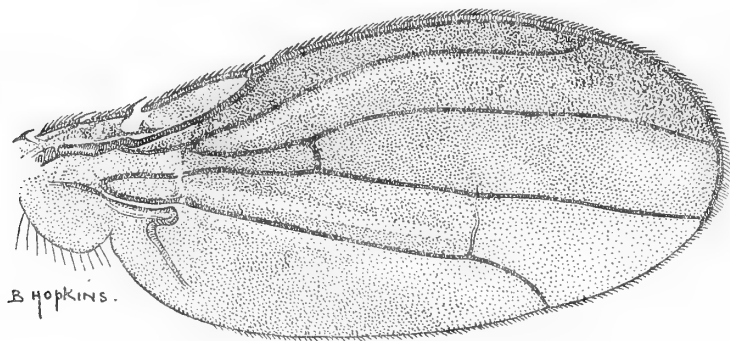
Head testaceous yellow, the face more whitish, the frons brownish-yellow, and the genae darker above and on a line below. Antennae slightly browned on upper side of the second and upper margin of third segment, aristae brown, palpi whitish-yellow. Structure much as in the genotype, but the lower reclinate bristle is distinct though very small, the face is more broadly carinate, with a less pronounced dip at the lower margin of the carina, the arista is as in *comma*, and the palpi are slightly widened, rather short, with one apical setulose hair and some weaker marginal hairs, the general form being elongate oval. Vertex but slightly emarginate on each side of the ocelli. Eyes nearly twice as high as long in profile.

Thorax brownish testaceous, hardly shining, the mesonotum without dark vittae, the pleura paler than mesonotum in female, darker than it is in male,

becoming almost blackish-brown below in that sex. All three pairs of dorso-centrals quite strong, and the other armature similar to that of *comma*, the scutellum with several setulose hairs on each side. Surface of mesonotum not alutaceous, slightly shining.

Abdomen shining brownish-yellow, the apices of the tergites infuscated and a variable discal dark mark on each that sometimes covers most of the dorsal exposure, the lateral incurved portions of segments largely pale.

Legs honey-yellow, all coxae and bases of femora in male slightly darkened and similar in colour to the lower part of the pleura. Femora more thickened basally in male than in female, the fore pair stoutest, the armature of the posterior side as in the two preceding species, but the strong posteroventral bristle beyond middle is more markedly developed, and the anteroventral surface has one or



TEXT-FIG. 4.—*Samoaia hirta*, wing.

two series of fine erect hairs of moderate length that extend from the base to about the apical third that are more pronounced in the male than in the female. Structure of legs as in the two preceding species, the hind tibiae slightly curved; hind metatarsus with two short black setulae at base below.

Wings yellowish-brown, paler along each side of the fifth vein on almost the entire extent of the discal cell. Second vein more abruptly, sometimes sub-angularly, bent forward near apex to connect with the costa (Fig. 4).

Halteres brown. Squamae with quite long sparse dark hairs.

Holotype ♂, Upolu: Malololelei, 2,000 feet, 20.vi.1924, Buxton & Hopkins.

Allotype, Upolu: same locality as holotype, 10.iii.1924, Buxton & Hopkins.

Paratypes, Upolu: same locality as above, 20.vi.1924, Buxton and Hopkins; Savaii: Salailua, 2,000–4,000 feet, May, 1924, Bryan.

4. *Samoaia nuda*, sp. n.

Superficially similar to *hirta*, but distinguished readily by the distinctly vittate mesonotum and the dark spotted legs.

Length, 3–4.5 mm.

Head brownish-yellow, with a black mark on each vibrissal angle, and a pale brown mark on each gena below eye. Structurally similar to that of *hirta*, but the emarginations of the vertex are more pronounced, and the only arista that is intact has the hairs nine in number, 6 : 1 : 2.

Thorax brownish-yellow, slightly shining, the surface rather noticeably alutaceous, especially on scutellum, the mesonotum with four dark brown vittae, the central pair entire and carried over scutellum, the lateral pair broken at suture. Anterior pair of dorsocentrals much shorter than usual, apparently undeveloped in the paratype, though they may have been rubbed off as the specimen is abraded. The scutellum bare on sides.

Abdomen as in *hirta*.

Legs honey-yellow, marked as in *comma*, but with a brown mark on each fore coxa near middle. The fore femur differs from that of any of the other species in lacking a strong bristle beyond the middle on both the anterodorsal and posteroventral surfaces; the anteroventral surface without exceptional hairing. Fore tarsus not as obviously flattened as in *comma*.

Wings as in *hirta*, the second vein with the same subangular preapical bend forward.

Halteres yellow.

Holotype ♀, Savaii : Salailua, 17.v.1924, Bryan.

There is a second specimen, mentioned in the description, in which the thorax is abraded and the mesonotum is more obviously alutaceous, that may not belong to this species, but it agrees so closely in markings and general structure that I am placing it here. It is the larger of the two specimens and is the only one in which the arista is sufficiently well preserved to permit a statement as to the number of free hairs. These hairs appear to be quite constant in number in the species of which there are series available, and are possibly of value in specific determinations in the genus, though I know that in *Drosophila* there is some variation in their number in certain species.

Locality, topotypical with holotype.

It may be noted here that *Drosophila* (*Paradrosophila*) *novoguineensis* Duda,

has the sides of the scutellum partly haired, but Duda makes no mention of the anterior pair of dorsocentrals, and the wings are hyaline.

Zygothrica Wiedemann.

This South American genus has not hitherto been recorded from any other faunal region, and it was a surprise to discover a quite typical species in the material in hand. The distinguishing characters lie in the heavily chitinized straight proboscis, which has the apical section at least as long as the height of the head. In the genotype the eyes are usually more or less pedunculate in the male, but while this was considered at one time to be a generic character it is not so, many species having the head almost normal in the structure of the lateral portions. In the present species the head is not wider than the thorax. The three orbital bristles are well developed and in an almost straight longitudinal line, about equally separated at bases, the genae are quite distinctly raised or enlarged on lower half, and the proboscis is fully as long as the height of the head and quite strong.

5. *Zygothrica samoensis*, sp. n. (Text-fig. 5).

Head mostly dark above, thorax and abdomen black on dorsum, the pleura, the lateral incurved parts of the abdominal tergites, and the entire legs pale stramineous. Wings slightly smoky, more distinctly so at bases. Halteres yellow, knobs black.

Length, 2.5 mm.

♀. *Head* brownish-black, frons with orbits and a central line brownish-yellow, when seen from the side and in front with white dusting, face with the upper margin of carina dull yellow, lower half of occiput pale yellow; antennae fuscous, basal two segments largely brownish-yellow; palpi and proboscis deep black. Frons about 1.25 times as long as its anterior width, slightly widened to posterior margin, the triangle not at all developed, the bristles all rather strong, the post-verticals and anterior reclinate orbital shorter than the others, the centre of interfrontalia with a few microscopic hairs in front. Profile as Fig. 5. Proboscis rather wide and of moderate strength, the sides almost parallel when seen from above. Palpi rather large, and with numerous hairs. Arista with nine long hairs (6 : 1 : 3) and some short hairs on upper side between the long rays. Eyes apparently nude.

Thorax dull black on entire dorsal surface, including the scutellum and postnotum, the pleura entirely pale yellow. All the hairs and bristles black. Dorsocentrals two pairs, both postsutural, the anterior pair not very far in front of the posterior and distinctly smaller than them, the intradorsocentral hairs in not less than eight rather irregular series, prealar well developed, presutural hardly developed, sternopleurals two, the posterior one the longer, scutellum rather elongate and somewhat flattened above, the bristles subequal in length.

Abdomen dull black on dorsum, yellow below lateral curve. Genital paired processes finger-like, with a rather broadly rounded dorsal plate above them which is fringed with some fine marginal bristles.

Legs entirely pale yellow, fore femur with a series of fine posteroventral bristles, only the hind tibia with a preapical dorsal bristle, which is very fine and inconspicuous.

Wings slightly smoky, more distinctly so at bases, third and fourth veins slightly convergent to apices, the distance between their apices not one-third as long as the one between apices of second and third veins; outer cross vein hardly half as long as apical section of fifth vein.

Halteres yellow, their knobs deep black.

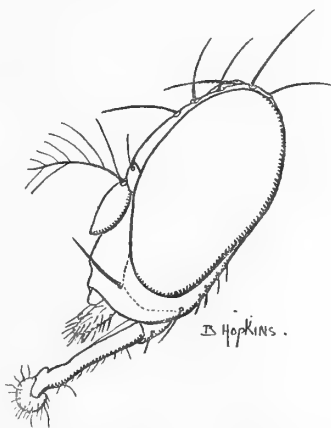
♂. Similar to the female, but the hypopygium is yellow, rather large and rounded in profile, with two series of moderately long fine hairs on its entire height at extremity which project straight backward.

Holotype ♀, Upolu: Malololelei, 2,000 feet, 30.xi.1924, Buxton & Hopkins.

Allotype, Savaii: Safune, 12.v.1924, Bryan.

Paratypes, same localities and collectors, twenty-one specimens.

I have carefully examined the descriptions of the numerous South and Central American species of this genus, and can find none that agree with it in all respects. There is no doubt in my mind that it is distinct from any heretofore described, but whether it occurs outside of the Samoan group it is impossible to conjecture. I have seen no other species of the genus, nor is any recorded, from Oceania.



TEXT-FIG. 5.—*Zygothrica samoensis*, head in profile.

Upolumyia, gen. n.

This genus is readily distinguished from any in the family by the possession of a short but distinct bristly hair about one-third from the base of the postero-dorsal surface of the hind tibia, and the relatively large anterior reclinate orbital bristle, all three orbitals being about the same length and strength, with the arrangement as in typical species of *Drosophila*. The face is sharply carinate on the upper half; the mesonotum has two subequal pairs of postsutural dorso-central bristles and the intradorsocentral hairs in more than six series. The wing is deeply notched at apex of the subcostal vein, and the lobe in front of the notch is conspicuously blackened as in the genus *Mycodrosophila*. In other respects similar to *Drosophila*.

Genotype, *Upolumyia pictifrons*, sp. n.

KEY TO THE SPECIES.

1. Frons with two conspicuous brownish black spots, one on each side close to eyes, surrounding the bases of the anterior reclinate and the proclinate bristles; wing with one brown cloud, situated immediately below the apex of the first vein and extending to second but not into the discal cell; pleura preponderantly black, with a spot on anterior margin near spiracle and a narrow central vitta on lower margin of the mesopleura pale yellow . . . *pictifrons*, sp. n.
- Frons with no conspicuous pair of spots near eyes; wing with the brown cloud as above, but with an additional and much larger one on the costa from before the apex of second vein to apex of third that tapers off behind and fades out about middle of the disc; pleura preponderantly pale yellow, a narrow upper marginal vitta and the upper half of the sternopleura brownish black . . . *bimaculata*, sp. n.

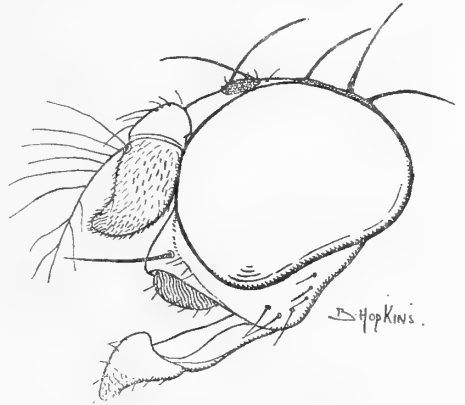
6. *Upolumyia pictifrons*, sp. n. (Text-figs. 6 and 7).

A pale testaceous yellow species with the frons marked with black on each side in front, the mesonotum with brown vittae, and the abdomen largely black with some pale yellow markings; legs yellow with dark brown markings, and wings with one brown cloud at apex of first vein.

Length, 2 mm.

Head pale clay yellow, the frons more or less clouded with brownish, the ocellar region with a fuscous mark, and each orbit with a black spot surrounding the bases of the anterior reclinate and the proclinate bristle, the surface elevated

at that point ; face blackened on the upper part of the high and sharp central carina of the upper half ; occiput largely dull brown ; antennae yellow, third segment, except its extreme base black, the arista yellow basally, brown beyond middle, the hairs dark ; palpi black. Profile as Fig. 6. Frons at vertex wider than its length in centre, at anterior margin about as wide as its length, all the bristles except the postvertical pair quite strong and long, the anterior reclinate one about as long as the posterior one, situated slightly in front of the proclinate one and distinctly closer to the eye ; ocellars quite closely placed and between the anterior and posterior ocelli ; surface with a few microscopic black hairs in centre in front ; the orbits and triangle not demarcated. Eyes narrowed below, with very short hairs ; face parallel-sided, receding below, the knife-like central carina ceasing at middle and not visible from the side because of the antennae ; the latter moderately large, the second segment with two short bristles and some minute hairs, third segment about twice as long as second and rather wide, densely pubescent ; arista normally with eleven hairs or rays, but two of which are below, and eight or nine hairs along the inner upper edge at bases of the rays that are about one-third as long as the latter ; gena very narrow ; vibrissa single and well developed ; palpi short and broad ; proboscis short, yellow.



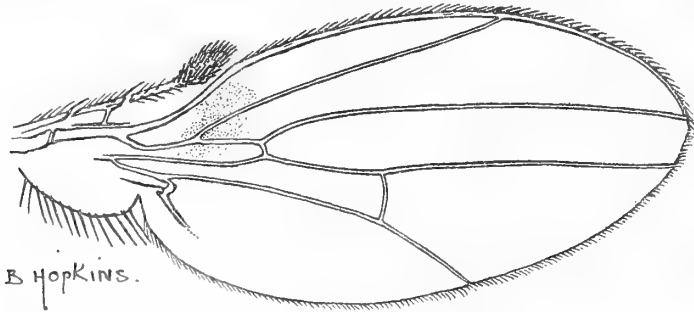
TEXT-FIG. 6.—*Upolomyia pictifrons*, head in profile.

Thorax whitish-yellow, with numerous brown to black markings. Mesonotum brownish-yellow, with four blackish-brown vittae, the central pair complete or with a slight reduction in intensity of the colour between the suture and hind margin, the lateral pair usually consisting of three separated spots, one in front, one just behind the suture, and a much fainter one at the postalar callosity, while there is a similar series of dark marks along each lateral margin ; pleura brownish-black, with a yellow spot at anterior spiracle, one below base of wing, and a vitta from the base of the fore coxa to the posterior spiracle ; postnotum dark brown in centre ; scutellum yellowish-brown, blackish across base and on sides. Mesonotum with two pairs of strong dorsocentrals, the anterior pair about midway between the suture and posterior margin, six or more series of short intradorsocentral hairs and no prescutellar acrostichals ; prealar and

presutural well developed ; scutellum bare on disc, slightly flattened above but without a definite ridge, the four bristles subequal in length. Sternopleurals two, the posterior one the longer.

Abdomen coloured as thorax, dorsal exposure dull brownish-black, with a series of small central spots, one on each tergite from second to fourth, and a lateral one on third and fourth, the terminal tergites yellow. Below the curve there is another series of yellow spots on the tergites.

Legs whitish-yellow, with the following brownish-black marks : A spot on anterior side of fore coxa at apex, two spots on the anterior and posterior sides of the fore femur that do not connect on the dorsal surface, a broad band nearer to apex than to base on each mid and hind femur, a narrow ring near base of the fore tibia and a much broader one on basal half of mid and hind pairs. Fore femur with some long posteroventral and posterodorsal bristles, one at apical third



TEXT-FIG. 7.—*Upolunymia pictifrons*, wing.

in each series longer than the others ; the femoral and tibial hairs in regular longitudinal series, as is usual in the family ; mid tibia with one long apical ventral bristle ; only the hind tibia with a distinct preapical dorsal bristle, and this pair also with a similar bristle on the posterodorsal surface about one-third from the base.

Wings (Fig. 7) hyaline, veins brown, a brown cloud below apex of first vein that extends over the disc to second vein, and the flap-like apical part of the first section of the costal vein deep black. This latter feature is found in the next species also, but the expansion of the costa at this point in the present species is much more marked than usual, so much so that when one views the edge of the costa the flap stands out strikingly above the wing level.

Halteres pale yellow.

Holotype ♀, Upolu : Vailima, 12.xii.1925, Buxton & Hopkins.

Allotype and two paratypes, Savaii : Salailua, 23.v.1924, Bryan.

7. *Upolomyia bimaculata*, sp. n.

Very similar to the genotype, but readily distinguished from it by the presence of two brown clouds on the costa of the wing, the lack of a pair of conspicuous black spots on the frons, and the differently marked pleura.

Length, 2 mm.

Head duller testaceous yellow than in *pictifrons*, the ocellar spot fuscous, and the only other dark markings consisting of the deeper brownish tone of each side of the interfrontal stripe, there being no dark orbital spots. General structure as in the genotype. *Arista* with only nine long rays, and orbits not raised in front.

Thorax brownish testaceous, the mesonotum with four pale brown vittae, the central pair complete, the pleura with a narrow upper marginal brown vitta and the sternopleura with the upper half brownish-black. Chaetotaxy, etc., as in the genotype.

Abdomen as in *pictifrons*, but the genital segments with a black central mark.

Legs honey-yellow, with dark markings arranged almost as in *pictifrons*, but the depth of their colour is less, being merely brown, and apparently there is either no band on the basal half of the mid and hind tibiae or it is very much reduced. It is unfortunate that in all four specimens available the legs are mostly immersed in the mounting medium and so obscured are the markings that it is impossible to give an accurate description. *Armature* as in the genotype.

Wings with the venation as in *pictifrons*, but in addition to the brown cloud below the apex of the first vein there is a much larger one on the apical half of the costa as described in the key to the species, and the apical part of the first section of the costal vein is much less expanded.

Halteres yellow.

Holotype ♂, allotype, and two paratypes, Savaii: Salailua, 23.v.1924, Bryan.

Mycodrosophila Oldenberg.

A genus of almost cosmopolitan distribution that contains very pretty little species of a deep black colour with pale yellow markings, the mesonotum much elevated and evenly rounded, with one pair of postsutural dorsocentrals and more than six series of intradorsocentral hairs, the wing with a deep notch before the apex of the first vein, and the tip of the costal section preceding the notch deep black.

As far as is known the species live in their larval stages in fungi.

There are three species in the Samoan collection, which are distinguished as below.

KEY TO THE SPECIES.

1. Mesonotum rather dull black owing to the presence on the surface of alutaceous sculpturing ; coxae entirely, femora and tibiae almost entirely brownish-black ; thorax entirely black *nigrithorax*, sp. n.
- Mesonotum glossy black, the surface showing very faint traces of microscopic alutaceous sculpturing under a very high-power lens ; legs, and pleura except the upper part, pale stramineous yellow 2
2. Wing with a distinct brown cloud below the apex of first vein that is carried over the field to fourth vein, and a brown suffusion along the source of the sixth vein ; halteres and palpi pale yellow ; ultimate section of fifth vein not half as long as the penultimate section of fourth ; abdomen with the dorsal exposure slightly shining, deep black except a yellow spot on each side anteriorly on first visible tergite, a larger yellow spot on each anterior lateral angle of fourth, and the sides of fifth entirely yellow *buxtoni*, sp. n.
- Wing with no brown cloud below the apex of first vein nor on sixth vein ; knobs of halteres partly dark brown to black ; palpi black ; ultimate section of fifth vein much over half as long as the penultimate section of fourth ; abdomen pale yellow, with a rather broad black apical fascia on each tergite that extends forward to anterior margin in centre *gratiosa* de Meijere.

8. *Mycodrosophila nigrithorax*, sp. n.

A rather large robust species for this genus, distinguished from its allies by the entirely black thorax, with the alutaceous mesonotum, and the preponderantly black colour of the legs.

Length, 3–3.5 mm.

Head black, frons reddish-brown in front in centre, the surface dull except on the upper setulose parts of the orbits and the ocellar spot, the upper extremity of the facial carina yellowish, the sides of the face densely silvery white dusted ; antennae fuscous, third segment pale brown ; palpi black. Frons subquadrate, the vertex and anterior margins roundly emarginate, the orbits distinct only to the proclinate bristle which is close to the middle of frons, the anterior reclinate

orbital not half as long as the upper, or posterior, one, situated between the latter and the proclinate one though a little nearer to eye margin than either ; all the other bristles, including the postvertical pair, quite long and strong, the short surface hairs very sparse. Eyes higher than long, narrowed below, subnude. Face with a broad central carina that narrows to a point above, is slightly flattened on most of its extent, and ceases rather abruptly about level of lower margin of eyes, from which point the face is almost straight to epistome, the surface microscopically alutaceous ; gena about as high as width of third antennal segment, the latter about twice as long as second segment, narrowly rounded at apex ; arista with seven free hairs, two below ; prelabrum broad ; palpi deep black, leaf-like.

Thorax entirely black, the surface of mesonotum finely alutaceous, the pleura not alutaceous, and with very fine whitish-grey dusting, the humeri slightly brownish, dusted in front on inner side. Chaetotaxy normal, but there are two humerals, the dorsocentrals are rather farther back than usual, and the hairs are carried behind them almost to the scutellum. Scutellum deep velvety black, the apex grey dusted.

Abdomen black, first tergite and anterior margin of second yellow, the remaining tergites each with large transverse yellow marks on each anterior lateral angle that do not form complete pale anterior margins.

Legs black, apices of all femora narrowly, bases of tibiae, and all of tarsi brownish-yellow, the tibiae not as deep in colour as the femora. Posteroventral bristles on fore femur very short and fine.

Wings brownish hyaline, with the usual black spot at apex of first costal division from which there extends over the field of the wing to fourth vein in front of the inner cross vein a distinct brown cloud ; the outer cross vein very slightly clouded with brown. Third costal division about two-thirds as long as second, the black setulae on costal vein ceasing about half the length of fourth section from apex of third ; third and fourth veins slightly convergent apically ; ultimate section of fifth vein fully 1.5 times as long as outer cross vein.

Knobs of *halteres* yellow.

Holotype ♂, Upolu : Malololelei, 25.ii.1924, Buxton & Hopkins.

Allotype, Upolu : same locality as type, 20.vi.1924, Buxton & Hopkins.

Paratype female, Savaii : Salailua, 23.v.1924, Bryan.

9. *Mycodrosophila gratiosa* (de Meijere).

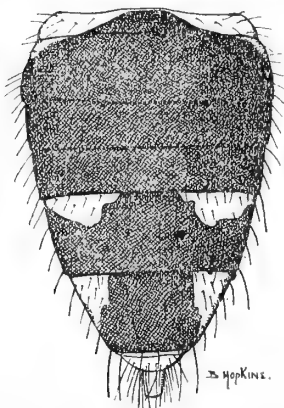
This pretty little species is quite widely distributed in the Pacific Islands and Malayan Region. It may readily be distinguished from its allies by the characters listed in the foregoing key to the species.

Originally described from Java, it has been recorded from Fiji and is represented in this collection by specimens from Upolu, the localities being Apia, 29.iii.1924, and 25.xi.1924, Buxton & Hopkins, and Savaii: Safune, May, 1924, Bryan.

I have described a closely related species from the Society Islands, and below add another to the same group.

10. *Mycodrosophila buxtoni*, sp. n. (Text-fig. 8).

A very pretty little species with the same centrally white dusted frons as in *gratiosa* and the same glossy black mesonotum as in that species, but with the wings marked as in *nigrithorax* below the apex of first vein, though the outer cross vein is not clouded.



Length, 2 mm.

TEXT-FIG. 8.—*Mycodrosophila buxtoni*, abdomen from above.

Head black, central third of frons yellow from anterior ocellus to anterior margin, the pale part silvery white dusted, the upper half of each orbit glossy, face brownish-yellow, slightly dusted on sides, the antennae of same colour, gena brownish-black on anterior half, becoming pale yellow behind, the lower occiput of that colour; prelabrum brown; palpi and proboscis pale yellow. Frons about as long in centre as wide at vertex, narrowed in front, the proclinate bristle close to middle of frons and the anterior reclinate one undeveloped, the postverticals not as long as the ocellars.

Face with a narrowly rounded central carina that is separated from the slightly protruded epistome by a distinct depression. Arista with seven free hairs, apparently but one below. Gena almost linear.

Mesonotum deep black, highly polished, the armature as in *nigrithorax* except that the intradorsocentral hairs cease at level of the dorsocentral bristles; pleura whitish-yellow, with a black upper marginal stripe that widens in front.

Scutellum dull black, without grey apical dust, but distinctly shining on the apical margin, the basal pair of bristles not half as long as the apical pair (equal in *nigrithorax*).

Abdomen black, with yellow markings, dorsum as Fig. 8.

Legs entirely pale yellow. Fore femur with a series of very short fine postero-ventral bristles, the hind tibiae only with a distinct preapical dorsal bristle.

Wings hyaline, with a brownish cast beyond the sub-basal dark mark, the brown cloud below apex of first vein much as in *nigrithorax*, but narrower, and a brown shade along course of sixth vein. Second costal division hardly longer than second, the black costal setulae extending less than two-thirds of the distance between apices of second and third veins, inner cross vein at basal third of discal cell, veins 3 and 4 convergent at apices, outer cross vein about half as long as ultimate section of fifth vein.

Halteres yellow.

Holotype ♀, Upolu : Malololelei, 2,000 feet, 28.vi.1924, Buxton & Hopkins.

Lissocephala Malloch.

I erected this genus for the reception of an African species in which the frons is entirely smooth and glossy, without any interfrontal depressed or dull-coloured lines, and the fore femur lacks an anteroventral comb of short stout spinules. It is closely related to *Liodrosophila* Duda, but the latter has usually part of the frons dull, and the fore femur has a well-developed comb of short and stout black spines on the apical half of the anteroventral surface. There are a few other less evident distinctions also present.

The species described below agrees very closely with the African species in its essential generic details, but has the anal cell and anal vein less evident. I prefer to accept it as congeneric with the African species rather than erect a new genus for its reception.

11. *Lissocephala* *versicolor*, sp. n.

A very pretty little species of a general fulvous yellow colour, with the frons darkened posteriorly and slightly metallic, the posterior half of the mesonotum and upper half of pleura metallic violet, scutellum dull fulvous, abdomen entirely metallic, the basal two tergites blue, the apical three green,

legs yellow, and the wings hyaline, with a fuscous basal streak from the apex of first vein to the alula.

Length, 1.5 mm.

Head fulvous yellow, the entire frons smooth and glossy, darkened on upper half or more and with a metallic blue tinge on the dark parts, the ocellar spot and upper orbits darkest, antennae brownish yellow, palpi paler, face usually slightly darkened in the foveae. Frons sharp on vertex, the posterior ocelli situated on its edge, the posterior width equal to its central length, narrowed to anterior margin where it is about one-third of the head width, the surface smooth, the anterior half in centre with two or three pairs of stiff incurved setulose hairs, all four verticals, the ocellars, and upper reclinate bristles, long, proclinate bristles shorter, the anterior reclinate bristle and the postvertical pair very short, the former placed a little above level of the proclinate bristle and between it and eye. Antennae of average size, the second segment half immersed below the anterior edge of the frons, the third pilose and about 1.5 as long as its basal width; arista with seven free hairs, two below. Face with a rather narrow rounded carina which is separated from the slightly elevated epistome by a deep depressed line. Eyes large, the facets moderate in size, the surface hairs numerous and fine, not in definite series; gena linear, palpi rather broad, with several short marginal setae, vibrissa single, strong but not very long.

Thorax glossy fulvous yellow, the upper half of pleura, notopleural region, and posterior third or more of the mesonotum suffused with dark metallic violet, the scutellum dull fulvous, the apex with some yellow dust, postnotum metallic violet. Dorsocentrals two pairs, intradorsocentral hairs in six series, presutural bristle long, basal pair of scutellars about one-third as long as the apical pair, sternopleura with two long bristles.

Abdomen dark metallic blue on basal two and green on apical three tergites.

Legs entirely honey-yellow, fore coxae more whitish. Fore femur with one or two bristles at apex on posteroventral surface; fore tarsus unmodified, the basal segment about as long as the next two combined.

Wings hyaline, with a fuscous streak at base that runs backward from apex of first vein to the alula. General shape oval, the alula small, the apex narrowly rounded, third vein ending in tip, second section of costa slightly shorter than third, the black setulae lacking on a part at apex about equal to length of fourth section; inner cross vein about one-fifth from base of discal

cell; fifth vein ending almost below apex of second, its apical section about twice as long as outer cross vein.

Knobs of *halteres* black.

Holotype ♂, Upolu: Vailima, 12.xii.1925, Buxton & Hopkins.

Allotype, Upolu: Vaea, 1,100 feet, 25.iv.1924, Bryan.

Paratypes, Upolu, and Savaii, same collectors.

This species is very similar to *Drosophila metallescens* de Meijere, which is undoubtedly a *Lissocephala*.

Hopkinsomyia, gen. n.

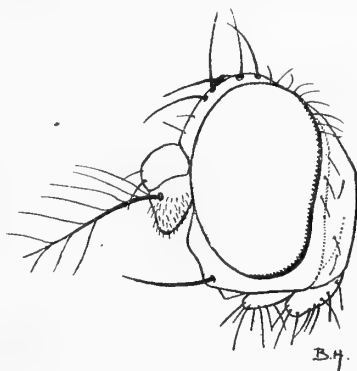
This is the only genus known to me that is closely related to *Drosophila* in which the face is markedly narrowed below. In addition to this character the vibrissa is not duplicated, the eyes are haired, the third antennal segment is short pilose, and the mesonotum has two pairs of long dorsocentrals, the anterior pair being close behind the suture. Whether the reduced length of the basal pair of scutellar bristles will prove to be a generic character if other species are found, remains to be established. Other characters of the species, some of which may yet be used as generic criteria, may be noted in the following description of the genotype.

12. *Hopkinsomyia convergens*, sp. n. (Text-fig. 9.)

A small testaceous yellow species, with the ocellar spot and palpi fuscous, the mesonotum with four fuscous or brownish vittae that are evident only on the posterior half or slightly more of the surface, the central pair distinct on the disc of the scutellum, mesopleura pale brown, dorsum of abdomen dark brown, legs entirely pale, and the wings hyaline.

Length, 1.5 mm.

Head testaceous yellow, the face almost white, ocellar spot fuscous, antennae brownish-yellow, palpi fuscous to black. Profile as Fig. 9, the eyes with larger facets than usual, the hind margin slightly emarginate on lower half, and the entire surface with lines of short stiff erect hairs. Frons almost parallel-sided, at vertex



TEXT-FIG. 9.—*Hopkinsomyia convergens*, head in profile.

about twice as wide as long in centre, with the orbits more shining than the interfrontalia, all the bristles except the microscopic anterior reclinate one long and strong, the latter situated above and laterad of the proclinate bristle and not much larger than the few surface hairs adjacent to it. Face carinate on the upper two-thirds, the carina widened below, the face at lower angles of eyes not over two-thirds as wide as at antennal insertions; vibrissa long, single; gena linear. Second antennal segment somewhat tumid, with the usual two bristles and some very short hairs, third segment about 1.5 as long as second, densely pubescent; arista usually with thirteen free hairs, three of them below. Palpi slightly widened and with a number of setulae, two of them larger than the others.

Thorax testaceous yellow, shining, the mesonotum with four dark brownish vittae that commence behind suture, the central pair continued over the disc of the scutellum, the mesopleura largely brown, and the humeri and notopleural suture also of that colour. Dorsocentrals two strong pairs, the anterior pair close behind the suture, presutural long, one humeral, the posterior notopleural and postalar bristles short; basal pair of scutellars about half as long as the apical pair; sternopleura with one long and one very short bristle; intra-dorsocentral hairs in six series; the prescutellar acrostichals undeveloped.

Abdomen dark brown above in female, paler in male, the genitalia of latter pale yellow.

Legs stramineous, the hind femur with a minute shining brown dot on anterior side at tip. Fore femur with a series of sparse posteroventral bristles, one or two on apical half longer than the others, and no anteroventral spinules. Preapical dorsal bristle on all the tibiae remarkably short and fine; tarsal claws longer in the male than in the female, the fore tarsus unmodified in either sex.

Wings hyaline, veins pale brown, apex quite pointed, with the third vein ending in the tip. Second section of the costa hardly longer than the third, the latter with the short black setulae continued almost to its apex; inner cross vein beyond middle of discal cell, penultimate section of fourth vein in female about one-fifth as long as its ultimate section and three-fourths as long as ultimate section of fifth, comparatively shorter in the male.

Halteres yellowish-brown.

Holotype ♀, Upolu: Vailima, 12.xii.1925, Buxton & Hopkins.

Allotype and one female paratype, Savaii: Safune, 4 and 11.v.1924, Bryan.

Paratype male and female, Viti Levu, Fiji Isl., June, 1924, Bryan.

The genus is named in honour of Mr. G. H. E. Hopkins, who collected much of the material used in this report.

Hirtodrosophila Duda.

1924. *Arch. f. Naturges.*, 90 A, 2, 203; 90 A, 3, 242.

This group was originally segregated as a subgenus, but it appears to be worthy of generic rank according to the standards accepted in the family in general. Duda has placed *Hirtodrosophila* as a synonym of *Dasydrosophila* Duda, but the latter was not published until 1925,* so that if the two groups were in perfect agreement *Hirtodrosophila* would require to be used. Possibly the author considered the latter a hybrid name and the second was to rectify matters. In any case my opinion is that the name should stand as it was first proposed. To prevent confusion I now designate as the genotype of *Hirtodrosophila*, *Drosophila hirticornis* de Meijere, an Oriental species, and as that of *Dasydrosophila*, *Dasydrosophila nasalis* Duda, the first included species from Central America. The latter has but four series of intradorsocentral hairs, and the facial carina is much more extensive than in the other group, being markedly widened below.

I have examined several species of *Hirtodrosophila* in the United States National Museum that were presented by Dr. Duda, including the genotype, and consider that Duda was in error in ranking the several so-called varieties of *latifrons* as mere variations of the latter instead of as distinct species.

It may be of interest to note here also that *latifrons* was proposed as a new name for *carinata* and *asteiodea* (!), and that, despite the fact that the author apparently considered this course necessary because of the use of the specific name *carinata* by de Meijere in *Drosophila* in 1901, he retained both names as varietal in the 1926 paper in which he proposed *latifrons*.† As he still considered *Dasydrosophila* as a subgenus, the course was improper and the name *carinata* must be supplanted by *latifrons* Duda even if it is only that of a variety.

There are three species in this collection which may be distinguished as below.

* *Ann. Mus. Nat. Hung.*, 22, 193.

† *Supp. Ent.*, 14, 67.

KEY TO THE SPECIES.

1. Head with the frons, face, and upper half of occiput black, the mesonotum and scutellum also black, and the remainder of the insect pale yellow; costa without a dark spot at apex of first section. *seminigra* Duda.
- Not sharply bicoloured species, general colour brownish to yellowish testaceous, the head with only a small dark mark on the gena and vibrissal angle, or the ocellar spot fuscous, and the pleura not or very little paler than the mesonotum and scutellum 2
2. Mesonotum pale brownish testaceous, with a darker line along the upper margin of each humerus; basal pair of scutellar bristles not noticeably shorter than the apical pair; wing with a very distinct though small dark mark at apex of the first costal section *unicolor*, sp. n.
- Mesonotum dark brownish testaceous, more distinctly shining and without a dark line along the upper margin of the humerus; basal pair of scutellar bristles much shorter than the apical pair; costa of the wing without a dark spot at apex of the first section *innocua*, sp. n.

13. *Hirtodrosophila seminigra* Duda.

This small species, which closely resembles a minute *Mycodrosophila*, was originally described as a variety of *lavifrons* Duda, but I am convinced that it is a distinct species. As the original description was extremely brief I offer further details below.

Head black, face more brownish, genae except at anterior angles and the lower half of the occiput pale yellow. Face with a rather narrow rounded carina which is highest about middle and tapers off below that to the epistome which is slightly elevated. Anterior reclinate bristle minute; postverticals rather small, cruciate. Vibrissae single. Third antennal segment over twice as long as second, reaching almost to epistome, with the usual long upper marginal hairs. Palpi and proboscis pale yellow, the former with one apical black setula. Eyes with short stiff seriate hairs.

Mesonotum and scutellum deep black, with black bristles and hairs, the basal pair of scutellars much shorter than the apical pair. Pleura and postnotum pale yellow.

Abdomen and *halteres* pale yellow.

Legs entirely pale yellow, the tibiae and tarsi with the usual short out-standing scattered hairs.

Wings hyaline, veins yellow, no dark spot at apex of first costal section, the third section fully as long as second, with the short black setulae extending to near its middle; inner cross vein slightly before middle of discal cell, ultimate section of fifth vein nearly three times as long as outer cross vein.

Originally described from Sumatra. There are three specimens in this collection from Savaii: Salailua, May, 1924, Bryan.

14. *Hirtodrosophila unicolor*, sp. n.

A small dull brownish-yellow species with no conspicuous markings, those present in any specimen consisting of a brown mark on the genae, one along upper edge of each humerus, and a black spot at apex of the first costal division that is confined to the veins at that point.

Length, 1-1.25 mm.

Head dull brownish-yellow, the ocellar spot not darkened, and usually a dark brown mark on the centre of the genae that sometimes extends to the vibrissal angle. Frons parallel-sided, a little longer than wide, with the orbits slightly paler than the interfrontalia and slightly shining; anterior reclinate bristle present but very small; postverticals much smaller than the ocellars. Face paler than interfrontalia, with the same type of carina as in *seminigra*. Third antennal segment brownish, with some of the upper marginal hairs longer than its width; arista with six free hairs, one below. Eyes as in *seminigra*. Gena about half as high as width of third antennal segment, vibrissa single. Palpi slightly dilated, with one long apical hair.

Thorax dull brownish yellow, with slight indication of yellowish dust, a brown mark along the upper edge of each humerus, and the hairs and bristles dark brown. Basal pair of scutellar bristles almost as long as the apical pair.

Abdomen concolorous with the thorax.

Legs unicolorous yellow, with the usual erect scattered hairs on tibiae and tarsi and two or three moderately long posteroventral bristles on fore femur.

Wings much as in *seminigra*, but more yellowish, with the dark costal spot, and the second costal section comparatively longer. *Halteres* yellow.

Holotype ♂, and paratypes, Upolu: Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins. Paratypes, Savaii: Safune, May, 1924, Bryan.

15. *Hirtodrosophila innocua*, sp. n.

An obscure looking little species, very like the next preceding one, but of a darker general colour, the ocellar spot fuscous, the mesonotum more distinctly shining and rather dark brown, and the wing without any trace of a darkening of the costal vein at apex of the first section.

Length, 1.5 mm.

Head as in *unicolor*, but the frons darker and with the ocellar spot fuscous. The facial carina is quite distinctly widened below, the third antennal segment is less distinctly haired, and the gena is higher, with the central brownish mark less distinct, and the proboscis is longer, almost as long as height of the head.

Mesonotum shining brown, the pleura paler, the armature as in *unicolor*, but the basal pair of scutellar bristles is hardly more than half as long as the apical pair.

Abdomen coloured as thorax, paler on sides and apex.

Legs as in *unicolor*, the tibial hairs quite distinct and widely scattered, the fore tarsus longer than its tibia, the basal segment not as long as the next two combined, all segments with scattered, rather erect, curled hairs that are longer than the diameter of the segments.

Wings hyaline, veins pale brown, the venation as in *unicolor*.

Halteres pale brown.

Holotype ♀, Upolu : Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

Allotype and one ♂ paratype, Savaii : Safune, 12.v.1924, Bryan.

The type specimen is rather immature so that details of coloration cannot be made out very clearly, nor are the two other specimens much better, but I am convinced that the species is distinct from *unicolor* though closely related to it. The third antennal segment has some erect upper marginal hairs and is longer than in most other genera while the arista has but one hair below which is near apex, characters that place the species in this genus.

Saptomyza Hardy.

This genus as represented in Europe and most of its range contains species of rather slender build, with the head smaller than is the general rule in *Drosophila* and the wings also rather narrower. They are distinguished from that genus by the presence of not more than four series of intradorsocentral hairs on the mesonotum. While this may appear a rather trivial character for generic

separation it holds throughout the range of the concepts and is generally accepted by taxonomists. In the Marquesas Islands we meet with the greatest diversity of structure in *Scaptomyza* and its closest relatives, and in Samoa there are no species that present the characteristic slender appearance of the more typical representatives of the genus. I have placed in *Scaptomyza* two species from these islands neither of which is in most respects like the more common species of the genus and which are probably due to be relegated either to other genera or at least new subgenera thereof. As I am in possession of only one specimen of each species I prefer to treat them tentatively as aberrant species of the genus rather than as representatives of new genera. A summary of the characters of these may be found in the following descriptions.

KEY TO THE SPECIES.

1. Frontal triangle glossy black, separated from the upper half of the orbits, which are similar in colour, by a less distinctly shining stripe, the anterior or lower half of each orbit deep velvety black; mesonotum and mesopleura black, the former with a broad central stripe shagreened and dull, the mesopleura glossy, remainder of pleura and the entire legs stramineous *stramineipes*, sp. n.
- Frons orange-yellow in centre, the pale part narrowed in front of the ocelli, widened behind where it encloses the dark ocellar spot, and less widened in front, the orbits glossy black, widest at middle and tapered to anterior extremities; mesonotum and upper half of pleura fuscous, humeral angles yellowish, mesonotum shagreened, lower half of pleura and legs yellow, fore tibiae and basal three segments of fore tarsi fuscous *bicolor*, sp. n.

16. *Scaptomyza stramineipes*, sp. n.

A black species with the posterior angle of jowls, sides of scutellum, the postnotum, and the abdomen apically brownish yellow, the prosternum, sternopleura, and legs straw-yellow, the large frontal triangle and narrow upper halves of the orbits glossy, wings hyaline, and halteres yellow.

Length, 2 mm.

Head black, with the posterior angle of jowls brownish-yellow, the frontal triangle, upper half of each orbit, and the face except a line on each side, glossy. Frons about as wide as long, hardly narrowed in front, the triangle extending to anterior margin, blunt at tip, with an opalescent stripe along each side to

near its posterior margin where the orbits connect with it, the latter distinct to base of the proclinate bristle which is situated slightly in front of middle of frons, the anterior reclinate bristle microscopic, the lateral margins of frons in front of the orbits deep velvety black. Inner vertical bristles much longer than the outer pair, the latter, the ocellars, and upper reclinate bristle about equal in length, the proclinate bristle shorter, and the postvertical pair quite short and cruciate. Face with a linear carina between the bases of the antennae, below that with a broad transverse depression, the epistome slightly elevated. Antennae rather large, third segment densely pubescent; arista with about thirteen free hairs, three or four below. Eyes a little higher than long and slightly narrowed below, with short fine hairs of moderate density. Gena a mere line, the single vibrissa of average length. Palpi black, not much widened, with a terminal setula and marginal hairs.

Thorax black, mesonotum distinctly shining on sides, with a greyish dusted central vitta covering the intradorsocentral area on its entire extent and extending to apex of the scutellum; pleura yellow on lower half, the postnotum and the lower part of sides of the scutellum brownish yellow. Mesonotum with two pairs of strong postsutural dorsocentrals, the anterior pair nearer to the suture than to the posterior pair, the intradorsocentral hairs in two central and two less regular lateral series, the prescutellar acrostichals lacking, presutural bristle lacking in type, sternopleura with one long bristle, the scutellum short, slightly flattened above, with four long subequal bristles.

Abdomen fuscous at base, gradually becoming paler to apex where it is yellowish brown.

Legs stramineous. Fore femur without well-developed posteroventral bristles; all tibiae with distinct preapical dorsal bristle.

Wings brownish hyaline, yellowish at extreme bases, the veins brown, general shape rather narrow, the alulae small. Second section of costa fully three times as long as third, the latter about twice as long as fourth, with the black costal setulae ceasing at about its middle; inner cross vein at about one-third from base of discal cell, penultimate section of fourth vein over two-thirds as long as ultimate, outer cross vein but little shorter than ultimate section of fifth.

Halteres brownish-yellow.

Holotype ♂, Savaii: Salailua, 23.v.1924, Bryan.

17. *Scaptomyza bicolor*, sp. n.

This species, though very similar in general form and colour to *stramineipes*, is quite different in the markings of the head, which has a central yellow frontal vitta on its entire extent, in the lack of yellow markings on the lower half of the pleura and in having the fore legs largely blackened.

Length, 2 mm.

Head black, with a fulvous yellow central stripe that begins above neck and extends to anterior margin of frons, widened at ocelli and again slightly at anterior margin of frons, the face yellowish brown, genae also of that colour, antennae, palpi, and proboscis orange-yellow. Frons at least as long as its width at vertex, narrowed in front, the orbits glossy black, at vertex each is a little less than one-third of the width of latter, their widest point in front of ocelli, and from there slightly tapered to anterior margin. All bristles distinct, the anterior reclinate one very small, the proclinate one rather close to anterior margin. Face less distinctly carinate above than in the preceding species, with a slight central emargination in the raised epistome, gena almost linear, vibrissa single and fine. Eyes with stiff almost seriate surface hairs. Black part of occiput velvety except on lower edge. Antennae rather small, third segment pubescent; arista with nine free hairs, three below. Palpi small.

Thorax shining black, broadly brown on humeral angles, the surface not as distinctively dusted between the dorsocentral series as in the preceding species, rather evenly alutaceous, and more convex, the general bristling differing in that there is one long humeral and a longer presutural. Scutellum convex, alutaceous, the basal pair of bristles fully as long as the apical pair.

Abdomen shining black, rather slender.

Legs yellow, rather strong, the fore tibiae and basal three segments of the fore tarsi blackened. Fore femur with very short fine posteroventral bristles, hairs on fore tarsi rather stronger than usual but still inconspicuous, all tibiae with a preapical dorsal bristle.

Wings hyaline, with a slight brown tinge centrally from base to apex, the second vein paler than the others. General shape elongate oval, the alulae very small and the apex more pointed than in *stramineipes*. In other respects the structure is much as in that species, but the outer cross vein is at about twice its own length from the apex of fifth vein, and the anal cell and sixth vein are more distinct.

Halteres with the knobs fuscous.

Holotype ♂, Upolu : Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

This species is readily distinguished from any known to me in this genus by the highly polished and very wide frontal orbits, and in some respects it agrees rather well with the genus *Incisurifrons* Duda, but it has more in common with *Scaptomyza*, so I have placed it in the latter genus though subsequent investigation of further material may cause its removal therefrom.

Drosophila Fallén.

This genus contains a very large number of species, some of them very widespread in distribution and very common. There are many segregates in the genus as generally accepted, most of them having been given subgeneric appellations by Dr. Duda, those most easily differentiated being accepted in this paper, but there are several more that may eventually be recognized as either subgenera or genera by subsequent workers. I present below a key to the Samoan species, in which I use one or two previously unrecognized distinguishing characters.

KEY TO THE SPECIES.

- 1. Mesonotum with a pair of well differentiated prescutellar acrostichal bristles;* second section of the costa not twice as long as third, the latter with the small black setulae on the anterior edge of the costal vein extending to or beyond its apical third; fore tarsus of both sexes slender and not exceptionally haired nor bristled, the basal segment about as long as the remaining four combined; bristles yellowish-brown; vibrissa single, no strong setula below it; eyes with very short dense, erect, stiff hairs 12
- Mesonotum without a differentiated pair of prescutellar acrostichal bristles, and the other characters not as above in their entirety 2
- 2. Frons densely silvery white dusted except on the orbits and a slender central line; face brownish yellow, with the epistome rather broadly whitish and white dusted, the carina narrow, confined to the upper half; pleura honey-yellow, with two dark brown vittae, one on the upper margin, the other on middle; posteroventral surface of the fore femur with one or two fine and short bristles at apex *albifrontata*, sp. n.

* This character was used as the basis for the erection of the subgenus *Paradrosophila* by Duda. Unfortunately the group thus limited is just as diversified in its constituents as is *Drosophila*, and I do not make use of the subgenus herein.

- Frons nowhere densely silvery white dusted 3
- 3. Vibrissa single, no additional bristle or setulae below it ;
black species, with fuscous to black halteres, and
averaging 2 mm. in length 4
- Vibrissa duplicated with a second bristle below it that is
nearly as long ; species generally fulvous yellow, if dark
then about 3 mm. in length 5
- 4. Second costal division not twice as long as third, the latter
about three times as long as fourth, and with the short
black setulae on the anterior edge of the costal vein
extending to about one-fourth from its apex ; face
vertical and almost hidden in profile, with a narrowly
rounded carina between the bases of the antennae that
widens out as it descends until it extends over the entire
central part below, where there is no transverse depres-
sion, the epistome receding ; gena fully as high as width
of palpus *convexa*, sp. n.
- Second costal division fully three times as long as third,
the latter not over twice as long as fourth, with the short
black setulae on anterior edge of the costal vein extending
to about midway between apices of the second and third
veins ; face hidden centrally in profile, with a linear
carina between bases of antennae that widens out below
but is not continued below middle, the lower half with a
rather deep rounded transverse depression, and the
epistome angularly produced in profile ; gena a mere
line, not as high as width of palpus *nigrifrons*, sp. n.
- 5. Large species, averaging 3 mm. in length ; second division
of the costa not less than 2.5 times as long as third, the
latter about twice as long as fourth and the ultimate
section of fifth vein hardly longer than the outer cross
vein 6
- Small species, averaging less than 2 mm. in length ; second
division of the costa not, or very slightly, over twice as
long as third, the latter much over twice as long as fourth,
and the ultimate section of the fifth vein much over twice
as long as the outer cross vein 7
- 6. Dark brown species, with brown halteres ; the small black
setulae on the anterior edge of the costal vein carried
beyond the apex of second vein about four-fifths of the
distance to the apex of third vein ; eyes with very fine,
short, widely spaced hairs on entire extent *upoluae*, sp. n.
- Brownish-yellow to fulvous yellow species ; the black
setulae on the anterior edge of the costal vein not carried
distinctly beyond midway from apex of second to apex
of third vein ; eyes with short stiff closely placed hairs,
most dense above *hypopygialis*, sp. n.
- 7. Males 8
- Females 10

8. Fore metatarsus without short, stiff, closely placed spines on anterior edge, the ventral surface with numerous transverse series of erect, stiff, yellowish-brown setulae . . . *errans* Malloch.
- Fore metatarsus with at least a part of its anterior edge furnished with a series of closely placed black comb-like bristles 9
9. Fore metatarsus with the apical half or less with a comb-like series of black bristles *ampelophila* Loew.
- Fore metatarsus and the second segment also furnished with a comb-like series of short black bristles *montium* de Meijere
10. Third section of the costa a little less than half as long as the second; hairs and bristles of the abdomen normal; the short black setulae on anterior edge of the costal vein extending to about middle of third section, the length of the setulose edge not greater than that of fourth section *ampelophila* Loew.
- Third section of the costa fully half as long as the second; the short black costal setulae extending to beyond middle of third section, the length of the setulose edge distinctly greater than fourth section 11
11. Bristles of abdomen normal, rather fine *errans* Malloch.
- Apical bristles of abdominal tergites much stouter than usual *montium* de Meijere.
12. The four scutellar bristles equally long and strong; the small black setulae on the costal vein extending two-thirds of the distance from apex of second vein to apex of third *excepta*, sp. n.
- The basal pair of scutellar bristles about half as long as the apical pair; the small black setulae on the costal vein extending three-fourths of the distance from apex of second vein to apex of third *bryani*, sp. n.

18. *Drosophila ampelophila* Loew.

This and the next two species belong to the same group of small testaceous yellow to fulvous yellow forms with very similar habitus and structure. Of these *ampelophila* and *errans* occur in both the Old and New Worlds. The first is readily distinguished from the other two in the male sex by the armature of the fore metatarsus as indicated in the foregoing key to the species, but there are one or two other species that have the same type of armature. I have given in the key characters for the separation of the females of the three species and hope I have succeeded in providing a dependable means of doing this.

Originally described from North America, this species occurs in Europe and elsewhere almost as commonly indoors as outdoors, being particularly attracted

to fermenting liquids and to fruits. In many districts it is well known by the name of "Vinegar-fly."

Upolu : Apia, xii.1924, Buxton & Hopkins, No. 694, bred from rotten mangoes.

19. *Drosophila montium* de Meijere.

Very similar to *ampelophila*, but readily distinguished in the male sex by the presence of the dense comb-like arrangement of short black bristles on the second as well as the first segment of the fore tarsus, and in the female by the longer third section of the costal vein of the wing.

Originally described from the Dutch East Indies and probably generally distributed throughout the Orient.

Upolu : Apia, August 1924, and Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

20. *Drosophila errans* Malloch.

This species was described under the name *similis* by Lamb from the Seychelles Islands, and it is the same as that accepted as *ananassae* Doleschall by Duda. I am certain that the material before me is referable to *errans*, but am not certain if *ananassae* is identical with it or with one of the two preceding species, so make use of the name *errans*, which I recently proposed as a substitute for *similis*, which was preoccupied in the genus when used by Lamb.

I have seen this species from the Marquesas Islands and have no doubt it is widely distributed in the Orient and the Pacific Islands.

Upolu : Apia, August 1924, and Malololelei, 25.xi.1924, Buxton & Hopkins.

Savaii : Salailua, May 1924, Bryan.

Tutuila : Amauli, 9.v.1923, Swezey and Wilder.

21. *Drosophila albifrontata*, sp. n.

A very distinctly marked species with the two broad silvery white dusted vittae on the frons, bivittate pleura, and almost entirely black abdomen.

Length, 2.25 mm.

Head fulvous yellow, frons brown except on upper orbits, the disc overlaid with dense silvery white dust except on the narrow orbital stripes and a mere

line in centre, face with a dark transverse central vitta and below that the epistome rather broadly yellowish-white and overlaid with slight whitish dust, third antennal segment brown, palpi fuscous, proboscis yellow. Frons about as long as its width at vertex, narrowed to anterior margin, the surface slightly depressed centrally, the bristles all well developed except the postvertical pair, which are much shorter than the ocellars, and the anterior reclinate bristle which is microscopic, the latter situated almost between the other two orbitals. Antennae quite large and with the hairs on upper edge of third segment rather longer than usual, but not as marked as in *Hirtodrosophila*, the arista with thirteen free hairs, three of them below. Face without a definite carina above, transversely depressed in centre, the epistome slightly projecting. Eyes a little higher than long, slightly narrowed below, with dense stiff seriate hairs. Gena a mere line, the vibrissa single and rather well developed.

Thorax glossy fulvous yellow, paler on lateral edges of mesonotum and pleura, the former with a dark irregular vitta near each lateral margin, and four dark vittae that are evident only posteriorly, the pleura with an upper marginal and a central dark vitta, and most of the disc of the scutellum blackened, postnotum fulvous yellow. Dorsocentrals two postsutural pairs, intradorsocentral hairs in six series, prescutellar acrostichals lacking, humerals two, the upper one small, presutural well developed, sternopleurals three, unequal in length; scutellum slightly convex above, the outline broadly rounded, the four bristles subequal.

Abdomen shining black, yellowish at extreme base, genital processes with a series of minute black points along their lower edges.

Legs honey-yellow, the fore femur without a series of posteroventral bristles and all the tibiae with a distinct preapical dorsal bristle.

Wings brownish hyaline, veins brown. Second costal division fully three times as long as third, the latter about twice as long as fourth, with the short black costal setulae present only on its anterior third, the outer cross vein at about 1.5 times its own length from apex of fifth vein, inner cross vein at a little over one-third from base of discal cell, penultimate section of fourth vein about half as long as ultimate section, anal cell present, anal vein indistinct. Alulae small.

Halteres brownish yellow.

Holotype ♀, Upolu : Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

This is the most distinctive species of the genus in the collection as far as body markings are concerned, the white dusted frons being unique in the material

though there are one or two species from other parts of the region that have somewhat similar coloration. The lack of a definite facial carina is also a good character for the distinction of the species.

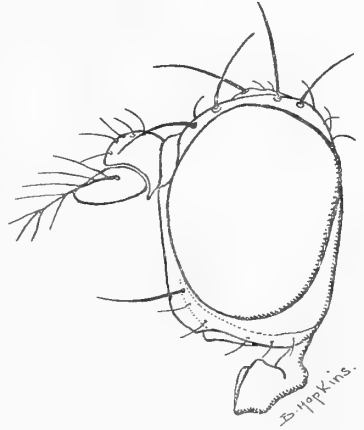
22. *Drosophila convexa*, sp. n. (Text-fig. 10).

A rather well-distinguished species of a general black colour, with the face of characteristic structure, almost vertical in profile, the central carina being but slightly prominent and not at all nose-like, shading off on lower third or less to the rounded epistome.

Length, 2 mm.

Head in profile as Fig. 10. Occiput and frons black, the frontal orbits and triangle grey dusted, the interfrontalia with a reddish-brown tinge in front, face yellowish-brown, shining, the parafacials and genae paler and slightly dusted. Antennae black, orange-yellow below on second segment; palpi brownish-yellow, darker at apices. Frons at vertex about half the head width and almost twice as wide as its length from posterior ocellus to anterior margin, slightly narrowed anteriorly, the anterior margin emarginate so that the sides are longer than the centre, orbits slightly humped up at the bristles, the proclinate one in front of middle and about half as long as the upper reclinate one, the anterior reclinate minute, slightly proximad of the proclinate and much closer to the eye, all the other bristles including the postvertical pair quite long. Eyes with very minute erect pale and not very dense hairs. Face with a depression below each antenna that becomes obsolete before attaining the level of the vibrissae, the epistome rounded, gena linear, the vibrissa moderately well developed, with a series of much shorter setulose hairs behind it on genal margin. Antennae moderate in size, second segment with a number of stiff hairs and two rather well-developed short bristles; third segment pubescent; arista with eight free hairs, two or three below. Palpi slightly dilated, with two setulose hairs and some weaker hairs along margins.

Thorax black, slightly shining, with faint greyish dust, much damaged in type by the pin so that it is impossible to give a very good description, the



TEXT-FIG. 10.—*Drosophila convexa*, head in profile.

armature apparently similar to that of *albifrontata*, but only two sternopleurals present.

Abdomen shining black, rather slender.

Legs fuscous, trochanters and tarsi brownish-yellow. Fore femur with some posteroventral bristles, one or two on apical half rather long, fore tibia with some erect hairs rather longer than usual, fore tarsus longer than its tibia, basal segment about as long as the next three combined, some of the hairs more noticeable than usual, about as long as the diameter of the segments, fine and almost erect, especially on the apical two or three segments; all tibiae with a preapical dorsal bristle.

Wings yellowish hyaline, veins pale, second section of the costa not twice as long as third, the latter over three times as long as fourth and with the small black setulae on the costa carried to less than the length of fourth section from its apex, inner cross vein close to middle of discal cell, the ultimate section of fifth and penultimate section of fourth vein subequal in length.

Halteres brown.

Holotype ♂, and 1 ♂ Paratype, Upolu: Malololelei, 2,000 feet, xii.1925, Buxton & Hopkins.

23. *Drosophila nigrifrons*, sp. n.

A shining black species with the frons dull except on the triangle and orbits, second antennal segment above and the face brownish-yellow, mesonotum and abdomen entirely glossy black, legs of that colour, with the knees narrowly, apices of all tibiae, and the entire tarsi dull yellow. Wings hyaline, veins pale brown, becoming black at bases. Halteres dark brown.

Length, 2.5 mm.

Head black, frons with the orbits and triangle shining, the anterior margin brown; face dull brownish-yellow, antennae black, the second segment yellowish-brown apically, palpi fuscous. Frons about as wide at the middle as long, narrowed in front and widened behind, the triangle carried to the anterior margin, the orbits narrow, all the usual bristles present, the postvertical pair small and cruciate, the anterior reclinate one minute. Face brownish-yellow, with a rather low and broad carina on upper half that does not cease abruptly but tapers off below, the lower half with a shallow broad transverse depression and the epistome slightly angular. Gena linear, vibrissa single. Antennae rather large, third segment pubescent, arista with eleven free hairs, three below. Palpi

slightly dilated. Eyes a little higher than long, slightly tapered below, with very short, scattered, fine erect hairs.

Thorax shining black, the mesonotum almost glossy, the pleura very slightly greyish dusted. The armature almost as in the next preceding species.

Abdomen glossy black, immaculate.

Legs black, apices of femora and bases of tibiae narrowly, apices of tibiae more broadly, and the entire tarsi brownish-yellow. No abnormal armature present, basal segment of the fore tarsus about as long as the next two combined.

Wings greyish hyaline, veins pale brown, becoming black at bases. Second costal division fully three times as long as third, the latter a little over twice as long as fourth, with the short costal setulae ceasing short of its middle; inner cross vein not over one-third from base of the discal cell; outer cross vein not twice its own length from apex of fifth; ultimate section of fourth vein about 1.5 times as long as penultimate one.

Halteres brown.

Holotype ♀, and eight paratypes, Savaii: Safune, 2,000–4,000 feet, May, 1924, Bryan.

Allotype, Upolu, 3.vi.1924, Buxton & Hopkins.

24. *Drosophila upoluae*, sp. n. (Text-fig. 11).

A shining dark brown species, darkest on dorsum, the face and second antennal segment brownish-yellow, bases of the abdominal tergites distinctly paler than their apices, legs brownish-yellow, wings suffused with brown, becoming paler posteriorly and with no darker shade on the cross veins.

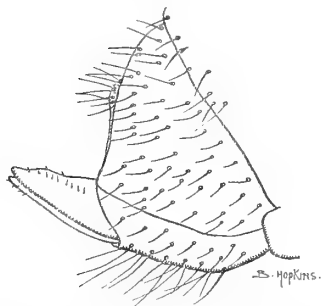
Length, 3.5 mm.

Head dark brown, the frons slightly reddish in centre, on anterior margin, and the orbits, the latter and the ocellar region slightly shining, face testaceous, much darker in the foveae and below them, greyish dusted on the carina and orbits, genae testaceous, grey dusted, prelabrum dark brown. Width of frons at anterior margin less than at vertex, at which latter it is fully as wide as its length in centre, all the bristles except the anterior reclinate one well developed, this being not half as long as the proclinate one, distinctly higher placed than, and slightly laterad of it; ocellar spot with numerous short hairs, the orbits in front of the bristles and the anterior margin of frons also haired. Antennae dark brown, second segment more yellowish and with the usual setulae, third segment

pilose; arista with twelve free hairs, four below, and the shorter hairs along the inner side rather longer than usual. Eyes with very short sparse hairs, and almost uniform-sized facets. Gena about as high as width of third antennal segment, vibrissae duplicated. Palpi moderately wide, brown. Facial carina quite prominent and rather broadly rounded below, abruptly ceasing a short distance from the epistome.

Thorax dark shining brown, the mesonotum with hardly a trace of dust, the pleura more noticeably greyish dusted and slightly paler, the chaetotaxy normal, the intradorsocentral hairs in six to eight series, both pairs of dorsocentrals strong, the prescutellar acrostichals lacking, and the sternopleurals two, both long.

Abdomen more glossy than the thorax, the apices of the tergites almost black, their bases brownish-yellow. Genital process as Fig. 11.



TEXT-FIG. 11. — *Drosophila upoluæ*, genital process of female in profile.

Legs brown. Fore femur with about four rather long posteroventral bristles, the fore tibia with two series of minute, widely spaced, erect fine hairs, one anterodorsal and the other posterodorsal, the fore tarsus also with some minute but slightly curled fine hairs; mid tibia with the preapical dorsal and apical ventral bristles well developed, mid metatarsus with a ridge on the entire extent of the anteroventral edge which consists of contiguous short black spinules and

on the posteroventral edge a series of longer and separated comb-like black spinules.

Wings distinctly brown tinged, slightly darker costally, the cross veins not clouded. Third section of the costa about one-third as long as second and less than twice as long as fourth, with the short black setulae continued over three-fourths of the distance to its apex, inner cross vein slightly proximad of middle of discal cell, penultimate section of fourth vein about two-thirds as long as ultimate, outer cross vein about its own length from apex of fifth vein.

Halteres dark brown.

Holotype ♀, Upolu: Apia, 22.v.1924, Buxton & Hopkins.

This species, which is unfortunately represented by only one female, is distinguished from any known to me by the dark brown colour, coupled with the very sparse hairs on the eyes, and the dark halteres.

25. *Drosophila hypopygialis*, sp. n. (Text-fig. 12).

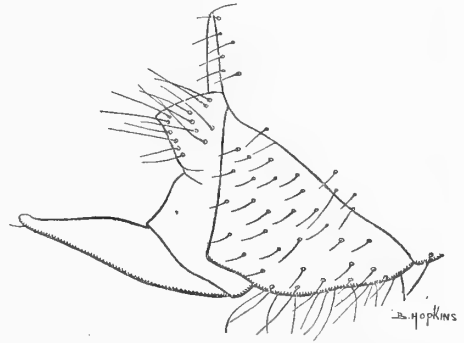
Very similar to *nasuta* in general appearance, but lacking the white dust on the frons in both sexes and the fore femoral comb of short spines on the antero-ventral surface. The apex of the abdomen is usually blackened in at least the male.

Head fulvous yellow, dull except on the upper bristled part of each frontal orbit and a line extending from anterior ocellus to anterior margin, which are but slightly shining, the face and genae with but faint greyish dust; antennae and palpi entirely pale. Frons similar to that of *upoluæ*, but the anterior reclinate bristle is almost midway between the proclinate and upper reclinate bristles. Eyes with quite dense stiff short hairs. Antennae normal, arista with eleven or twelve long free hairs, three or four below, and the hairs on anterior side rather well developed. Facial carina prominent, extending as far beyond eye in profile as width of the third antennal segment, gradually heightened from upper to lower extremity at which latter it is quite abruptly declivitous. Gena much narrower than third antennal segment, the vibrissae duplicated.

Thorax fulvous yellow, rather dull, without distinct dusting. Mesonotum with eight rather irregular series of intradorsocentral hairs, the anterior one of the two pairs of postsutural dorsocentrals distinctly shorter than the posterior pair, no prescutellar acrostichals present, two humerals and the presutural and prealar quite long; sternopleurals two, both strong.

Abdomen coloured as thorax, but the apices of the tergites are usually more or less browned, while in the male the sixth and succeeding segments are black, these segments less extensively black in the female. Hypopygium of male with a stout, straight, downwardly projecting process on venter; genital process of female rather slender, and tapered to apex (Fig. 12).

Legs a little paler than the thorax, unicolorous. Fore femur with five or six long posteroventral bristles; fore tibia normal, with some fine hairs much as in *upoluæ*; fore tarsus of male with the basal segment about as long as the next two combined and slightly thickened, with short curled hairs on most of its



TEXT-FIG. 12.—*Drosophila hypopygialis*, genital process of female in profile.

surface and its apex on anterior side with denser hairs than usual which give it a slightly produced appearance, the other segments with rather less noticeable hairing, the second segment about 1.5 times as long as the third; fore tarsus of female more slender than that of male, the segments not noticeably longer haired than usual, the basal segment about as long as the next two combined; mid tibia with the preapical dorsal bristle stronger than on other tibiae; mid metatarsus with a very short setula on the ventral surface near base, its anteroventral edge with a ridge of closely adherent minute black spinules on its entire length and the posteroventral edge with a series of short setulae; hind metatarsus and second segment with an anterior and an anteroventral ridge-like series of adherent small black spinules similar to that on the anteroventral edge of the mid metatarsus.

Wings brownish hyaline, the outer cross vein with a slight brownish cloud. Third costal section not over one-third as long as second and about twice as long as fourth, with the short black setulae ceasing at its middle; third and fourth veins slightly convergent apically, the penultimate section of fourth vein over four-fifths as long as the ultimate one; inner cross vein at about one-third from base of discal cell; outer cross vein at about its own length from apex of fifth.

Halteres fulvous.

Holotype ♂, allotype, and 18 paratypes, Upolu: Malololelei, 2,000 feet, xii.1925, Buxton & Hopkins.

Paratypes, Upolu: Vaea, 25.iv.1924, Savaii: Safune, 2,000–4,000 feet, 3.v.1924, Tutuila: Pago Pago, 16.iv.1924, Bryan.

This species has some characters, especially of the tarsi, that appear to associate it with the next genus listed herein, but there is no distinct anteroventral comb of minute black setulae on the fore femur, which feature has been used as the distinguishing character of the genus. It is not at all improbable that an intensive taxonomic study of the family in all its stages throughout the world will eventually prove that some at least of the present divisions are untenable or that the characters utilized for their separation are not productive of natural groupings and that a regrouping on other criteria is essential.

26. *Drosophila excepta*, sp. n.

This and the next species are both quite small and brown to brownish-black in colour, and may be distinguished from the other Samoan species by the presence of a distinct pair of prescutellar acrostichal bristles, which character

would in Duda's classification place them in the subgenus *Paradrosophila*. The character is not very constant in certain species, and there does not appear to me to be reason for the adoption of it as of subgeneric value, so I retain the two now under discussion in *Drosophila*. They may be distinguished from each other on the basis of the characters cited for that purpose in the foregoing key to the species.

Length, 1.5 mm.

Head brownish yellow, paler in front, the third antennal segment infuscated on upper margin and at apex. Frons about as wide at vertex as long in centre, narrowed to anterior margin, the bristles all well developed except the anterior reclinate one which is less than half as long as the proclinate bristle and situated very slightly in front of the latter and a little nearer to the eye, some minute hairs in front on sides and in centre. Eyes with dense erect short stiff hairs. Gena very narrow, almost linear, the vibrissa single and strong. Antennae normal, arista with eight long free hairs, three below, the inner hairs short. Facial carina linear above, narrowly rounded below, rather abruptly ceasing at about lower fifth of face and separated from epistome by a well marked depression.

Thorax brownish-yellow, without dusting and distinctly shining. Intra-dorsocentral hairs in at least six rather irregular series, the prescutellar pair of acrostichals not half as long as the posterior pair of dorsocentrals, the anterior pair of latter shorter than the posterior pair; sternopleurals two; other bristles as in *hypopygialis*, the four scutellar bristles equally long and strong.

Abdomen coloured as thorax, the tergites each with a dark apical fascia that is widened in centre. Genital process finger-like, rounded at tip.

Legs brownish-yellow, a little paler than the thorax, without exceptional armature or structure, the fore femur with three or four posteroventral bristles, the fore tarsus slender, without exceptional hairing, the basal segment about equal in length to the apical four combined.

Wings yellowish-hyaline, veins brown, the cross veins not clouded. Third section of the costa fully two-thirds as long as second and three times as long as fourth, the small black costal setulae extending about two-thirds of the distance to apex of third vein; inner cross vein about one-third from base of discal cell; outer cross vein fully twice its own length from apex of fifth vein; penultimate section of fourth vein about half as long as ultimate one; apical sections of third and fourth veins very slightly convergent apically.

Halteres yellow.

Holotype ♀, Upolu: Malololelei, 2,000 feet, 25.xi.1924, Buxton & Hopkins.

27. *Drosophila bryani*, sp. n.

Very similar in most respects to *excepta*, but darker in colour, the abdomen in the male especially mainly black.

Length, 1.5 mm.

Head similar to that of *excepta*, but darker, and the anterior reclinate bristle situated above the level of the base of the proclinate bristle.

Thorax dark brown, as in the preceding species, but with the basal pair of scutellar bristles much shorter than the apical pair. In both species the bristles and hairs are brownish yellow.

Abdomen almost entirely black in male, with paler bases to some of the tergites in the female, and the female genital process shorter and more pointed.

Wing as in *excepta*, differing mainly in the lesser extent of the unarmed apical part of the third costal division.

Holotype ♂, allotype, and four paratypes, Savaii: Safune, 12.v.1924, Bryan.

Paratypes, Tutuila: Leone Rd., 19.ii.1924, Bryan; Tau, Manua, 20.ii.1926, Judd.

The species is dedicated to the collector of the type, who has added many species to the collection.

Spinulophila Duda.

1924. *Ent. Medd.*, 14, 6, 248; *Arch. f. Naturges.*, 90, A, 203.

1926. *Acanthophila* Duda, *Suppl. Ent.*, 14, 84. (Not Hein., 1870).

This group, originally erected as a subgenus, may be considered, as herein, as entitled to generic rank. The principal distinguishing character is the presence of a series of short black spinules, rather closely placed, on the apical half of the anteroventral surface of the fore femur in both sexes. This type of armature recurs in *Liodrosophila* Duda, and in several other families of Acalyptrate Diptera, e.g. in Sapromyzidae and Ephydriidae.

The name *Spinulophila* was used by Duda in two papers printed in 1924, but which appeared first I am not in a position to state at this time, although it would seem that they appeared the reverse of my listing. In the first paper listed above but one species, *Drosophila tripunctata* Becker (1908), was included, which being a homonym of *D. tripunctata* Loew (1862), and a synonym of *D. cilifemur* Villeneuve (1921), would result in the latter being compulsorily the genotype unless the second paper listed above appeared first,

in which latter eventuality one of the Oriental species included therein would require to be selected instead.

The name *Acanthophila* was apparently proposed as a substitute for the hybrid *Spinulophila*, but unfortunately this is antedated by *Acanthophila* Hein. (1870) in Lepidoptera and is consequently not available.

There is but one species before me from Samoa, and this has been the subject of another change of name by Dr. Duda, as indicated in the following synonymy.

28. *Spinulophila nasuta* Lamb.

1914. *Drosophila nasuta* Lamb, *Trans. Linn. Soc. Lond.*, 16, 4, 346.

1923. *Drosophila (Spinulophila) sulfurigaster* Duda, *Ann. Nat. Mus. Hung.*, 20, 48.

1926. *Drosophila (Acanthophila) albovittata* Duda, *Suppl. Ent.*, 14, 87. (N.n. for *sulfurigaster* Duda).

1928. *Drosophila bilimbata* Bezzi, *Dipt. Fiji Isl.*, 159.

A fulvous yellow species, with the frons of the male quite noticeably white dusted on each orbit when seen from behind and with the whole surface thinly overcast with white dust when seen from in front and to one side, that of the female with the orbits much less evidently dusted and the dust not continued anterior to the proclinate bristle. The fore femur has the usual anteroventral comb, the fore tarsus is almost normal in structure and armature, the basal segment being about as long as the next two segments combined and not thickened, and though there are some very short erect hairs visible under a high-power lens they are not remarkable. Mid metatarsus in both sexes with a short black erect spinule near base on the ventral surface. The wings are brownish hyaline, with a very faint dark clouding of outer cross vein and no trace of clouding of the apices of the third and fourth, the third costal division about one-third as long as the second and 1.75 times as long as fourth, with the short black setulae ceasing about midway between the apices of second and third veins.

Length, 2-5.3 mm.

Upolu : Apia, 8.v.1924, and ii, 1924, Buxton & Hopkins, No. 649, bred from dung of bat (*Emballonura*), from cave.

Savaii : Salailua, May, 1924, Bryan.

Many specimens of this apparently common species.

I take this opportunity briefly to describe a Philippine species, a paratype of which is being sent to the British Museum.

Spinulophila metallescens, sp. n.

Similar in general features, size, colour, etc., to the preceding one, but differing notably from it and all other species yet described in having a blue or purple metallic tinge on the posterior half of the mesonotum that shades off in front, the scutellum fulvous and dull, the abdomen metallic blue-green on the basal two tergites and on apices of the others, and the next three tergites bright coppery. Frons entirely fulvous yellow and undusted. Fore tarsus slender in both sexes and normally haired, mid metatarsus with no basal ventral spinule.

Length, 2.5–3 mm.

Holotype ♂, allotype, and two paratypes, Mt. Maquiling, P.I. (C. F. Baker).

This species was sent to me several years ago by the collector and the type is in my collection, a paratype being placed in the United States National Museum.

It would appear worthy of mention that the synonymy of the European species and *immigrans* Sturtevant of North America suggested by Duda in his revision of the European *Drosophila* is not sustained by an examination of the species. The American species has the fore metatarsus distinctly thickened and the apices of the second, third, and fourth veins slightly clouded, neither of which characters are found in the European species. It also appears noteworthy that the North American species cannot be distinguished from one occurring in Australia which is represented by two specimens before me from Melbourne. I make no effort to explain this peculiar discontinuous distribution except to note that while it may be that *immigrans* does not occur in Europe or any other part of the Old World outside of Australia, it is more likely that lack of material from at least some part of this territory is due to scarcity of collectors of the micro-Diptera rather than to the absence of the species.

EPHYDRIDAE.

This family is very similar in some of its constituents to Drosophilidae, there being in the forms in which the frons has a proclinate and a reclinate orbital, a considerable approach to typical members of that family. I have yet to discover, however, in this section of the Ephydridae any genus in which there are long hairs on both the upper and lower sides of the arista and the mesopleura bare. In addition to these characters the tibiae usually lack the preapical

dorsal bristle, the prealar bristle of the mesonotum is lacking, the mouth is almost invariably much larger and the face has more bristles on the sides, while its lower central part is frequently setulose. In general, the postvertical bristles when present are divergent.

The great majority of the species are aquatic in their larval stages, most of them being found in marshy spots. One North American species lives in pools of petroleum, where the larvae feed upon insects caught on the surface film. North American natives have in the past used the puparia of certain species of *Ephydra* occurring in the saline lakes as food.

Bezzi has recorded four genera from Fiji, each represented by a single species, three of them being widely distributed in the Old World, and but one described as new. In some recent papers on the fauna of the Marquesas Islands I have recorded ten genera and thirteen species.

As there are but a few genera in the present collection it appears unnecessary to present a generic synopsis. The number of subfamilies has been increasing in the literature of recent years, but possibly the acceptance of but two would be proper, the Psilopinae and Notiphilinae in my opinion being inseparable on any characters of subfamily importance; the others being unrepresented to any degree in our material, it is unnecessary to deal with them.

NOTIPHILINAE.

This group is distinguished by the presence of a proclinate fronto-orbital and a reclinate bristle on each side of frons.

29. *Paralimna lineata* de Meijere.

A small species for this genus, being less than 3 mm. in length, and distinguished by the six or more narrow dark-brown mesonotal vittae that are separated by mere lines of yellow dust, and the entirely black legs. There are some long bristles on the costa basad of the humeral cross vein and one or two usually beyond that vein. The abdomen is shining black, with a transverse streak of dark grey dust on each side of each tergite near the posterior margin not meeting in centre.

Upolu : Malololelei, 2,000 feet, 1.v.1924 ; Tutuila : Pago Pago, 14.xii.1925. Originally described from Java and subsequently recorded from Fiji.

Psilopa Fallén.

1823. *Dipt. Suec., Hydrom.*, 6. 1.

This genus has been subjected to some changes according to the interpretations of various workers on the family, and herein I restrict it to contain those species in which the postvertical pair of bristles is microscopic and widely divergent, the mesonotum has four bristles in a transverse series beyond midway from the suture to the posterior margin, the scutellum has very few discal hairs, and the fore femur has the anteroventral surface with a series of microscopic erect blunt spinules on the apical half or more. This interpretation is based upon the characters of the genotype, *nitidula* Fallén, and several closely related species, e.g. *polita* Macq.; *compta* Meig.; *girschneri* v. Röd.; and *atrimana* Loew. The last-mentioned species has been placed in a separate genus, *Leptopsilopa* Cresson, but the only characters cited for the separation from *Psilopa* consist of the minute cross striation of the face, and the thickened fore tarsi of both sexes, which hardly entitle the group to even subgeneric segregation in my opinion.

It is to be regretted that in nearly all the taxonomic work on this group no mention has been made of the size of the postvertical pair of bristles, and in all cases in this genus the armature of the anteroventral surface of the fore femur has been ignored, or probably not examined because of the difficulty in making out this feature. For this reason a clear conception of the grouping of the species is impossible until these points are brought out by some one having access to the types of all the described species.

In the Samoan collection there is but one species that falls in *Psilopa* as restricted herein.

30. *Psilopa irregularis*, sp. n.

A small species of the same general colour and structure as *polita* Macquart, the frons and face metallic blue-green, and the thorax and abdomen with a blue or aeneous tinge.

Length, 1.5 mm.

Head black, frons bright metallic blue, with violet tinge above and greenish in front, the face of the same colour though becoming brownish on sides and with a very narrow pale dusted line on each side; antennae fuscous, third segment paler below at base; palpi pale brown. Frons depressed in front in centre, with

the usual bristles which are all long and strong except the postverticals, which are minute and widely divergent. Antennae moderately large, second segment with the usual two bristles, the apical one fully half as long as the third segment, the latter pilose; arista with eight or nine long upper rays. Face at narrowest point not half as wide as eye at same point seen from in front, widened below, its length about three times as great as its central width, the surface microscopically transversely striate, each side with a long bristle about one-fifth from epistome and a setula below it. Gena very narrow. Eyes with the anterior central facets enlarged.

Thorax black, with the mesonotum distinctly metallic blue tinged, the usual bristles present, humeral distinct, sternopleural long; scutellum with the basal pair of bristles distinctly shorter than the apical pair and only two or three hairs on the disc.

Abdomen glossy dark metallic blue, with a coppery or green tinge.

Legs fuscous, femora with blue tinge, tibiae brown, the mid and hind tarsi, except the apical segment and central part of fore pair, brownish-yellow. Armature typical.

Wings hyaline, veins pale brown. Second section of costa slightly shorter than third, costa with a bristle at apex of first section.

Knobs of *halteres* yellowish-white.

Holotype ♂ and two paratypes, Tutuila: 760-900 feet, 18.iv, Kellers.

This is possibly the species recorded from Fiji by Bezzi as *polita*, but the latter has the face much wider and entirely smooth, and the wings differently veined.

Eupsilopa, gen. n.

This genus is very similar to *Discocerina* Macquart, and the one dealt with immediately preceding it in this paper. The distinguishing characters are found in the frons, face, and wing venation. The vertex is quite sharp, the posterior ocelli are placed at upper margin with their hind edges touching the vertex, the postvertical bristles are about half as long as the ocellar pair, erect and divergent, with their bases in line with the anterior edges of the posterior ocelli, the ocellars are as usual long and proclinate, but they are inserted slightly behind the level of the anterior ocellus and slightly more widely separated than the posterior ocelli; facial foveae hardly evident, the face in profile more elevated below middle than in typical *Psilopa*, the larger upper bristle on a slightly elevated

base, and the lower part of face receding much as in *Discocerina*; second antennal segment with the apical curved bristle about half as long as the third antennal segment; arista with long upper hairs. Thorax as in *Psilopa*, the hairs in rather regular series, but the scutellum with only one or two marginal hairs besides the four bristles. Fore femur not serrated on anteroventral surface. Wings pictured, the second vein short, almost rectangularly bent forward at apex and with a short spur vein at angle (Fig. 13).

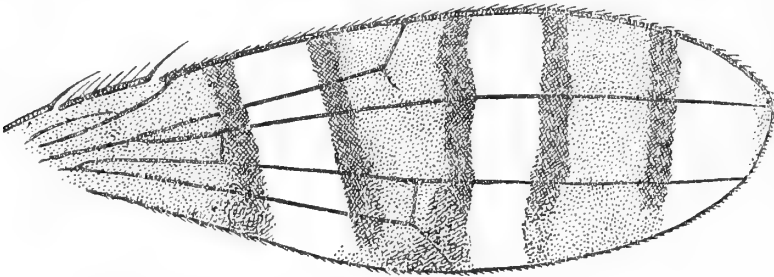
Genotype, *Eupsilopa fascipennis*, sp. n.

31. *Eupsilopa fascipennis*, sp. n. (Text-fig. 13).

A small shining black species, with yellowish antennae and legs and the wings hyaline with three pale brown rather wide fasciae, the basal one darkest, and the submedian and preapical fasciae with a narrow fuscous margin on both sides.

Length, 1.75 mm.

Head fuscous, frons, with the exception of the ocellar triangle and orbits, reddish-brown, face quite evenly grey dusted but still shining; antennae fulvous yellow, aristae fuscous; palpi and labrum fulvous yellow. Frons at vertex



TEXT-FIG. 13.—*Eupsilopa fascipennis*, wing.

almost twice as wide as its length in centre; triangle distinct, its surface slightly granulose, attaining almost the anterior margin; anterior margin of frons not as wide as vertex and distinctly wider than face at upper bristles. Face almost flat above the upper bristles and with but slight traces of foveae, convex below the bristles but not angulate above them, the lower pair of bristles near level of the epistome and about half as long as the upper pair; gena narrower than third antennal segment. Antennae of average size, third segment rounded at apex and pilose, second with the usual two bristles, the upper one short, the apical one fully half as long as third antennal segment; arista with five long upper rays.

Thorax black, slightly shining, with grey dust, the four long bristles behind the suture in a straight line about midway between the suture and posterior margin, the short hairs not in absolutely regular straight series, but not as promiscuously arranged as in *Discocerina*; presutural, both notopleural, the sternopleural, and all four scutellars long; the fine hairs on scutellum few and confined to the sides.

Abdomen glossy black, with a bronzy tinge apically and with a reddish section on basal half that is more marked in the male than in the female, the apex in the latter tapered, fifth tergite elongated, in male the apex rather stout and rounded, with some distinct bristles.

Legs, including the coxae, fulvous yellow. Fore femur with a few bristles on the apical half of the posteroventral surface, one near apex the longest; mid femur with some anterior bristles centrally, one much stronger than the others.

Wings hyaline, marked with fasciae as in Fig. 13, the second vein angularly bent forward near apex and with a short spur vein at the angle.

Halteres brownish-yellow.

Holotype ♂ and allotype, Tutuila: Pago Pago, 6.ix.1923 and 24.ix.1923, Swezey & Wilder.

Discocerina, Macquart.

This genus has been within recent years much more restricted than originally intended, the segregates removed from it having been distinguished very largely on the nature of the bristling of the lower half of the sides of the face. It is not pertinent that I go into the matter of these subdivisions here, but I cannot but feel that in some cases at least the erection of genera on these characters has not been very carefully considered. In the material before me there are representatives of two of the segregates, though a third one does not appear to be referable to any as yet recognized. I place them all provisionally in *Discocerina*, and make use of the facial armature in distinguishing them so that they may the more readily be classed with their nearest relatives on that basis.

KEY TO SPECIES.

1. Face densely covered with grey dust, the bristles on each side of lower half consisting of two series, one of three strong incurved bristles, the lower one at level of epistome, the upper near middle of face and the intermediate one nearer to the former, and a second series of less strong bristles consisting of one below the lower one of the

former series, another between the latter and the intermediate bristle, and two between the intermediate and upper bristles the upper one the longer, all of which are curved slightly outward, and a setula between the upper bristle and orbit on each side that is incurved; the narrow facial orbits with a series of microscopic hairs; genal bristle well developed; mesonotum with the short hairs rather closely and indiscriminately arranged, the prescutellar pair of acrostichals very close to hind margin, distinctly shorter than and behind the dorsocentrals; legs fuscous, knees and all tarsi brownish-yellow

dubia, sp. n.

— Face shining black, with no or very faint dusting and differently bristled and haired; knees not yellow; legs, except the bases of the tarsi, black

2

2. The upper pair of facial bristles separated by a distance not greater than that from their bases to the epistome; arista with five long upper rays; vertex with a quite well-developed incurved setula slightly outside of each of the outer vertical bristles; presutural acrostichal pair of bristles distinctly behind the level of the pair of dorsocentrals

atrifacies, sp. n.

— The upper pair of facial bristles separated by a distance distinctly greater than that from their bases to the epistome; arista usually with four long upper rays; vertex with a setula outside of each outer vertical bristle; presutural pair of acrostichal bristles in transverse line with the dorsocentrals

communis, sp. n.

32. *Discocerina atrifacies*, sp. n.

A small shining black species that appears to fit the description of the European *glabricula* Fallén very well, but the face is glossy and there are a number of fine hairs laterad of the strong bristles, the tarsi are more extensively blackened at apices, and the second costal section is fully 1.5 times as long as the third.

Length, 2 mm.

Head entirely black, the frons and face glossy, but when seen from the side with very faint brownish dust; antennae black. Frons at vertex a little wider than its length in centre, hardly narrowed in front, and but slightly depressed on anterior half, the triangle undifferentiated from remainder of the surface, all the bristles well-developed, the proclinate orbitals almost in line with the anterior ocellus and distinctly above middle of frons, the proclinate pair mesad of and but little in front of them, the orbital margins anteriorly with a series of microscopic fine hairs. Face higher than wide, narrowed slightly above, the upper

flattened part not as long as the lower convex part and with the foveae but faintly defined, the upper pair of bristles slightly above midway from epistome to bases of antennae, two below these, the uppermost slightly above epistome the other slightly below it and much the weaker, and in addition to the strong bristles there is also a series of fine short incurved hairs that extend from epistome to above the upper pair of bristles. Prelabrum rather narrow. Antennae rather small, second segment with the usual two bristles, the apical one almost as long as the third segment, which latter is more broadly rounded at apex than usual; arista with five long upper rays. Gena about half as high as third antennal segment, the posterior genal bristle strong. The small incurved setula laterad of the outer vertical bristle is quite distinct.

Thorax glossy black, the armature normal, as noted in the key to the species, the scutellum with numerous discal hairs, four long marginal bristles and one or two outstanding hairs on the sides between the bristles.

Abdomen glossy black.

Legs black, tarsi fulvous yellow at bases, the basal and base of second segment of fore pair, and the basal two and base of third of mid and hind pairs pale. Fore femur with a series of closely placed fine short hairs on the postero-ventral surface; mid femur with a series of short apically directed bristles on apical half of the anterior surface.

Wings hyaline, slightly infuscated at extreme bases, veins pale brown. Second costal section fully 1.5 times as long as the third, sometimes almost twice as long, the stiff costal setulae extending almost to apex of third vein, the first posterior cell very faintly narrowed at apex, outer cross vein at about its own length from apex of fifth, the latter not attaining margin of wing; basal section of costa with two or three of the setulae distinctly longer than the others on its entire extent.

Knobs of *halteres* white.

Holotype, Upolu: Malololelei, 2,000 feet, xii.1925, Buxton & Hopkins.

Paratype, Savaii: Safune, 2,000–4,000 feet, 8.v.1924, Bryan.

33. *Discocerina communis*, sp. n.

Very similar to *atrifacies* in general appearance and coloration, differing in being a little smaller in the characters noted in the generic key, except that in a few instances there are five upper rays on the arista, and in having the frontal

usually rather well differentiated, and the outer cross vein of the wing farther from the apex of the fifth.

Length, 1.5 mm.

Head black, not as glossy as in *atrifacies*, with slight brownish dust, and the triangle rather evident. The face is not as much flattened above, the upper pair of bristles is below the middle, and the second pair is slightly below the level of the epistome, while the short hairs so evident in *atrifacies* are not at all noticeable here, in fact they are usually almost lacking.

Thorax glossy black, with the armature differing from that of *atrifacies* as noted in the key to the species.

Abdomen glossy black.

Legs black, basal two segments of fore tarsi and basal three of mid and hind pairs fulvous yellow. Armature as in *atrifacies*.

Wings hyaline, very slightly browned at extreme bases, veins pale brown. Second section of the costa about twice as long as third, outer cross vein at more than its own length from apex of fifth, the latter not attaining margin, basal section of the costa with regular short fringe of setulae and without outstanding setulae.

Knobs of *halteres* whitish-yellow.

Holotype ♀, allotype, and five paratypes, Tutuila : Leone Rd., 19.ii.1924, Bryan.

Paratypes, Upolu : Apia, 11.iv.1925, large numbers sitting on fresh horse dung, Buxton & Hopkins.

34. *Discocerina dubia*, sp. n.

A dull-coloured species, with the face and thorax densely yellowish-grey dusted, the abdomen shining black, and the legs fuscous with the knees and tarsi fulvous yellow.

Length, 2 mm.

Head fuscous, the frons with brown dust, the face entirely yellowish-grey dusted. Antennae broken off in both available specimens. Frons at vertex a little narrower than its length in centre, narrowed in front, the sides slightly sinuate, all the bristles well developed, the small setula laterad of the outer vertical about one-fourth as long as the postverticals, the orbits rather distinct, widest at the bases of the bristles and with a series of microscopic hairs similar to those on the facial orbits though not as strong, the centre of the interfrontalia

with a pair of minute hairs closely placed a short distance above antennae, and the ocellar region with some similar hairs. Eyes with very short but dense hairs. Face depressed and very slightly bifoveolate on upper half, more convex on lower half than in either of the two preceding species, densely yellowish-grey dusted. Upper pair of bristles at middle, the arrangement as described in the key to species. Gena almost linear, grey dusted, with well-developed genal bristle behind.

Thorax black, shining, the mesonotum with grey dust that becomes brownish behind, the scutellum almost undusted. Prescutellar acrostichals slightly behind the dorsocentrals and rather close to the hind margin; scutellum with numerous discal hairs, four long bristles on margin, and between the laterals some rather long erect hairs.

Abdomen shining black, very faintly greyish dusted, more tapered in the male than in the female.

Legs fuscous, fore coxae, the trochanters, extreme bases and apices of femora and tibiae and all the tarsi brownish-yellow. Fore femur with a series of fine posteroventral hair-like bristles on the entire extent which become longer apically and along the inner or mesal side of these on the apical third a series of four or five short setulae; mid femur with a series of apically directed short bristles on the apical half of the anterior surface.

Wings greyish hyaline, rather pointed at apex, veins pale brown. Second section of the costa about 1.5 times as long as third, outer cross vein at distinctly less than its own length from apex of fifth, the latter not attaining margin of wing; basal section of costal vein rather strongly and evenly bristled.

Halteres brownish-yellow.

Holotype ♂, Upolu: Malololelei, 2,000 feet, 21.iv.1925, Buxton & Hopkins.

Allotype, topotypical, xii, 1925.

It may be worth noting that in the other two species there are no distinct hairs on the eyes and there is no evidence of central hairs on the interfrontalia.

It is entirely possible that this species has already been described, but it is not possible for me to determine this from the very brief descriptions which do not carry all the necessary details to insure identification.

EPHYDRINAE.

Chaetoscatella Malloch.

This genus is the only one in the present collection that belongs to the Ephydrinae, and is the second species that I have seen belonging to the genus. The description of the latter has not yet appeared in print, but will do so, I believe, before the present paper is published. The genotype was collected in the Society Islands, where it appears to be very common judging from the number of specimens I have seen.

The distinguishing generic characters are as follows: Frons with two outwardly directed orbitals on each side and a strong pair of ocellars; arista very short haired above; face with the usual large convexity which is entirely haired, though there are no long bristles on the upper central part of the convexity; mesonotum with two pairs of strong dorsocentrals, and a pair of strong acrostichals close to the suture; scutellum bare except for the four marginal bristles of which the basal pair is the shorter; pulvilli undeveloped; claws large; costa with a number of bristles from beyond apex of first to near apex of second vein that are longer than the diameter of the vein.

35. *Chaetoscatella unguiculata*, sp. n.

A black species with distinct aeneous or greenish lustre on head, thorax, and abdomen, entirely black legs, unspotted wings, and the tarsal claws almost rectangularly bent at bases.

Length, 2 mm.

Head black, with a distinct coppery to blue-green tinge, most marked on the frontal triangle, which is almost polished, the face slightly granulose, greenish, becoming bronzy or coppery on sides below; antennae blackish brown; palpi of the same colour. Frons as in the genotype, with the two pairs of orbital and the inner vertical bristles longer than the ocellar and outer verticals. Face less convex than in genotype, and with very fine hairs centrally, only two or three bristles on sides below.

Thorax black, the mesonotum distinctly metallic blue-green, the pleura pale grey dusted. Bristling as in genotype, but the basal pair of scutellar bristles a little shorter.

Abdomen black, shining, with a purplish tinge, and slightly brown dusted.

Legs black. Fifth tarsal segment slightly enlarged and as long as the tarsal claws, the latter almost rectangularly bent at bases and from the angle gently bent to their acute apices, the empodium as long as the claws and very distinctly fringed with fine hairs on one side to apex.

Wings brownish hyaline, veins dark brown. Second section of the costa as long as fourth vein from inner cross vein to its apex, the third about two-thirds as long as fourth, the apex of second vein almost directly above apex of fourth; outer cross vein at about its own length from apex of fifth, the latter faint at apex; costal bristles shorter than in the genotype.

Halteres pale yellow.

Holotype, Upolu: Malololelei, 2,000 feet, xii.1925, Buxton & Hopkins.

SPHAEROCERIDAE.

This family contains species that are almost exclusively scavengers, their larvae feeding in decaying vegetable or animal matter or manure, though some few have more specialized habits, one or two occurring in water at the bases of leaves of Bromeliacea in tropical America, and some in live fungi, or even in the nests of bumble-bees.

A few of the species are very widely distributed, but careful taxonomic studies of material from all faunal regions are required definitely to establish the identities of the more obscure forms throughout the range of the family, which is almost cosmopolitan.

Bezzi has recorded three species from Fiji, all belonging to the genus *Leptocera* Olivier, and all previously described from other regions.

Copromyza Fallén.*

This genus has its greatest development in Europe and North America, and is represented in regions south of the equator by immigrant species from the north.

36. *Copromyza sordida* Zetterstedt.

A very widely distributed small species, occurring in the Palearctic and Nearctic Regions, Northern Africa, the East Indies, and the Hawaiian Islands.

Upolu: Apia and Vaea, many specimens, some from the first locality taken from surface of fresh horse dung.

* It is to be noted that I am using the names adopted by O. W. Richards in his paper on the British Sphaeroceridae, *Proc. Zool. Soc. London*, 1930.

Leptocera Olivier.

This genus contains a very large number of species and has been split into a number of subgenera by Dr. O. Duda, some of which are difficult to distinguish from each other and have rather unstable grounds for recognition.

Bezzi has recorded three species from Fiji and apparently all three are in the present collection with an additional fourth one.

37. *Leptocera punctipennis* Wiedemann.

This species is one of the most readily recognizable in the genus because of the whitish spots of dust on the frons and dorsum of thorax, the white apices to the abdominal tergites, the yellow legs with two fuscous annuli on each tibia, and the presence of two small blackish spots on the fore part of the wing, one over the furcation of the second and third veins, and the other at the apex of the second vein.

Upolu : Apia, bred from human faeces ; Malololelei, 2,000 feet, 18.iv.1924, Buxton & Hopkins.

Occurs in Africa, Tropical America, the Orient, and several of the groups of the Pacific Islands. Described in America under the specific name *venalicia* by Osten Sacken, who suggested its introduction from Africa to Cuba with the slave trade between these points.

38. *Leptocera ferruginata* Stenhammar.

A rather variable species as to colour, but generally of a rusty brown tinge, varying sometimes to ferruginous, though occasionally almost black, with the disc of the scutellum armed with short strong hairs, and the basal segment of the mid tarsus with a prominent ventral bristle.

Savaii : Safune, 12 May, 1924, Bryan.

I have taken this species in immense numbers at fish refuse and on manure in Scotland, and have also found it commonly in North America in similar situations. It is recorded from Fiji by Bezzi.

39. *Leptocera puerula* Rondani.

A much smaller species than *ferruginata*, and distinguished by the yellowish face and anterior margin of the frons as well as by the lack of discal hairs on the scutellum. The dorsum of the thorax is shining black, the scutellum is

shorter and more convex than in *ferruginata*, and there is no long ventral bristle on the basal segment of the mid tarsus.

Upolu: Apia, February, 1925, fowl dung, Buxton & Hopkins. One specimen.

A Palearctic species that has been recorded from the Seychelles and Fiji.

40. *Leptocera curvinervis*, Stenhammar.

Four specimens that agree with the description and figure of the wing given by Duda in his paper on the European species, and that run down to this species in Richard's key to the British species are in the Samoan collection.

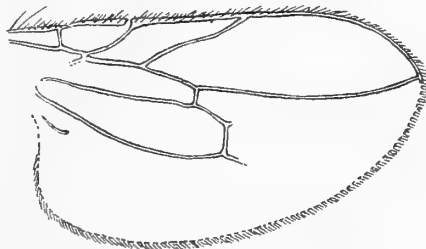
The fourth wing vein is evenly curved forward, the second costal division is over 1.5 times as long as the third, the costa has some short but quite evident bristles on its basal section, and the scutellum has six marginal bristles.

Savaii: Safune, E. H. Bryan, Jr.

A Palearctic species not previously recorded from the Pacific Region, but no doubt found elsewhere than in Samoa in that region.

Leptocera sp. (Text-fig. 14).

One female of a species that may be undescribed is before me, but I do not care to erect a new species on the strength of this single example in a genus so likely to contain widely spread species. I figure the wing (Fig. 14), which closely resembles that of *czernyi* Duda, so that should further material be obtained its identity may be determined.



Upolu: Apia, 16.v.1924, Buxton & Hopkins. TEXT-FIG. 14.—Wing of *Leptocera* sp. n. ?

MILICHIIDAE.

This family contains comparatively few species, but it is very widely distributed, occurring in all faunal regions. The larvae as far as we know are scavengers feeding in decaying vegetable and animal matter, which no doubt accounts for the widespread distribution of some of the species.

There are but two genera in the Samoan material, both of which were recorded by Bezzi from Fiji.

Milichiella Giglio-Tos.

Bezzi in his book on the Diptera of Fiji erroneously credits this genus to Meigen. There are a number of species of the genus, but only one of them is widely distributed, being almost cosmopolitan, and included amongst the Samoan material.

41. *Milichiella lacteipennis* (Loew).

A glossy black species, the male without any white dust on the abdomen and with the apical visible tergite elongated and rather long bristled on the sides. The wings are milky, less markedly so in the female, and the third and fourth veins are quite noticeably convergent apically.

Upolu : Apia, August, 1924, bred from guinea-pig dung, Buxton & Hopkins. Two specimens.

Desmometopa, Loew.

The species of this genus are rather similar in general appearance and it is difficult to determine them by the use of printed descriptions which are mainly based upon colour of the halteres, palpi, and the legs. I have separated the species now before me on the basis of structural as well as colour characters, and hope that it may be possible for subsequent workers to determine these species on the same bases. To facilitate identifications, I present below a key to the species.

KEY TO THE SPECIES.

- | | |
|---|--------------------------------|
| 1. Genae fully as high as width of the third antennal segment,
with a glossy blackish brown streak below the eye which
is angularly widened just behind the vibrissa (Fig. 15) | <i>m-nigrum</i> Zetterstedt. |
| — Genae not as high as width of the third antennal segment
and with at most a linear upper marginal shining black
streak | 2 |
| 2. Palpi pale yellow with a central dark brown mark across
the surface, and much widened, distinctly broader than
the third antennal segment, the bristles longer and
stronger than usual; tarsi distinctly fulvous yellow, the
fore pair least noticeably so | <i>palpalis</i> de Meijere, ♂. |
| — Palpi darker yellow, distinctly and rather broadly blackened
at apices | 3 |
| 3. Mid and hind tarsi very noticeably brownish yellow | <i>palpalis</i> de Meijere, ♀. |
| — All tarsi fuscous | <i>ciliata</i> Hendel. |

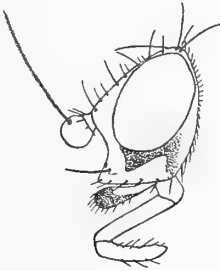
41A. *Desmometopa m-nigrum* Zetterstedt. (Text-fig. 15).

This species is not amongst the Samoan material, but it has been recorded from Fiji and I have it from Sydney, N.S.W., so that it in all probability occurs in the Samoan group.

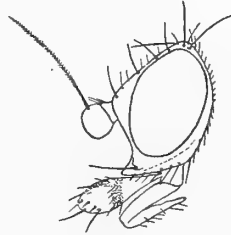
The much higher genae, with the angulate lower margin of the upper glossy black stripe as shown in Fig. 15 readily distinguish it from the other two species in my material. The short fringe of bristles on the base of the costal vein consists of longer and finer bristles than in the other two species, a character used by Hendel in his differentiation of it from *ciliata*.

42. *Desmometopa ciliata* Hendel.

A rather smaller and darker species than *m-nigrum*, with the genae almost as in *palpalis*, and the palpi small and coloured as in the former. The fringe



TEXT-FIG. 15.—Head of
Desmometopa m-nigrum,
male, in profile.



TEXT-FIG. 16.—Head of
Desmometopa palpalis,
male, in profile.

of bristles at the base of the costal vein is shorter and closer and consists of finer bristles than in *m-nigrum*, being almost identical with that of *palpalis*.

Upolu : Apia, ii, 1925, ex-fowl dung, Lot 731, Buxton & Hopkins.

I suspect that this is the species recorded from Fiji under the name *tarsalis* Loew, but an examination of Bezzi's material is essential to a definite conclusion on the point. An Australian species which I have from Sydney, N.S.W.

43. *Desmometopa palpalis* de Meijere (Text-fig. 16).

The large pale yellow brown-marked palpi are characteristic of the male only, the female having these organs very similar to those of the preceding two species even to the restriction of the dark markings to the apex and upper

margins. The mid and hind tarsi are quite conspicuously brownish or fulvous yellow as compared with the fuscous tarsi of the other two species.

There is no previous reference to this distinction in the palpi of the sexes. Head of male as in Fig. 16.

Upolu : Apia, ii, 1925, ex-fowl dung, Buxton & Hopkins.

LIST OF TEXT-FIGURES.

- Fig. 1. *Samoaia ocellaris*, wing.
 „ 2. „ „ head in profile.
 „ 3. „ *comma*, wing.
 „ 4. „ *hirta*, wing.
 „ 5. *Zygothrica samoensis*, head in profile.
 „ 6. *Upolomyia pictifrons*, head in profile.
 „ 7. „ „ wing.
 „ 8. *Mycodrosophila buxtoni*, abdomen from above.
 „ 9. *Hopkinsomyia convergens*, head in profile.
 „ 10. *Drosophila convexa*, head in profile.
 „ 11. „ *upoluae*, genital process of female in profile.
 „ 12. „ *hypopygialis*, genital process of female in profile.
 „ 13. *Eupsilopa fascipennis*, wing.
 „ 14. Wing of *Leptocera*, sp. n. ?
 „ 15. Head of *Desmometopa m-nigrum* male, in profile.
 „ 16. Head of *Desmometopa palpalis* male, in profile.

INSECTS OF SAMOA

AND OTHER SAMOAN TERRESTRIAL ARTHROPODA

LIST OF PARTS AND SYSTEM OF PUBLICATION:—

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| Part | I. Orthoptera and Dermaptera. (Complete.) |
| „ | II. Hemiptera. |
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PART IV. COLEOPTERA—*continued*.

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